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THE IRON AGE

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▲▲▲ THE IRON AGE ▲▲▲

SEPTEMBER 29, 1938

ESTABLISHED 1855 Vol. 142, No. 13

It Depends on Your Point of View

ONCE upon a time a progressive ant colony, anxious to add to its collective store of knowledge, determined to conduct a research project. It appointed two members of the colony to leave the environment of the home ant hill, travel abroad and find out what the world was like.

One of the two observers packed his belongings, set forth and finally came to the opening of a rabbit hole. "This," said he to himself, "must be the door to the world that I have been sent to see."

So the ant entered the hole, noted what he saw there and returned to the colony.

Meanwhile, the other ant travelled in another direction. He came to a tall tree which extended upward farther than his eyes could see. "This must be the ladder that leads to the world," said he. So he laboriously climbed to the top, observed what he saw from there, climbed down and returned to the colony.

The day came for the observers to report. Said the first ant: "The world is a deep round hole; it is damp and dark and it smells bad." Said the second ant: "The world is broad and flat, it is bright and full of color and pleasing scents."

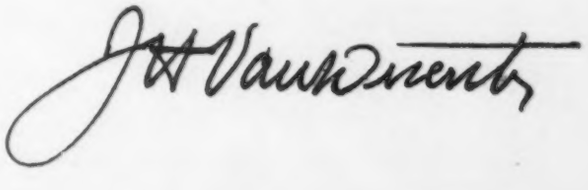
The members of the ant colony deliberated over these strangely varied findings. Having the proverbial frugality of their kind they decided that it would be useless to send out more observers. "For it is plain," said their Chairman, "that no two people see the world alike. Let us, therefore, strike an average between these two points of view."

So the ants decided that the world was neither altogether good nor altogether bad and that at any rate it was a place where you had to work if you wanted to eat. Then, they went back to work and have kept at it ever since.

There may be a thought in this for industrial executives and others who are apprehensive of the future because of the things that are going on at home and abroad. Let's remember that the observers who report these things are working in places where it is dark and damp and where things have an unpleasant smell.

We ought to send some of these fellows up into the tree tops so we can strike an average.

Or better still, just go back to work and keep at it.



Centralized Management of Materials Handling

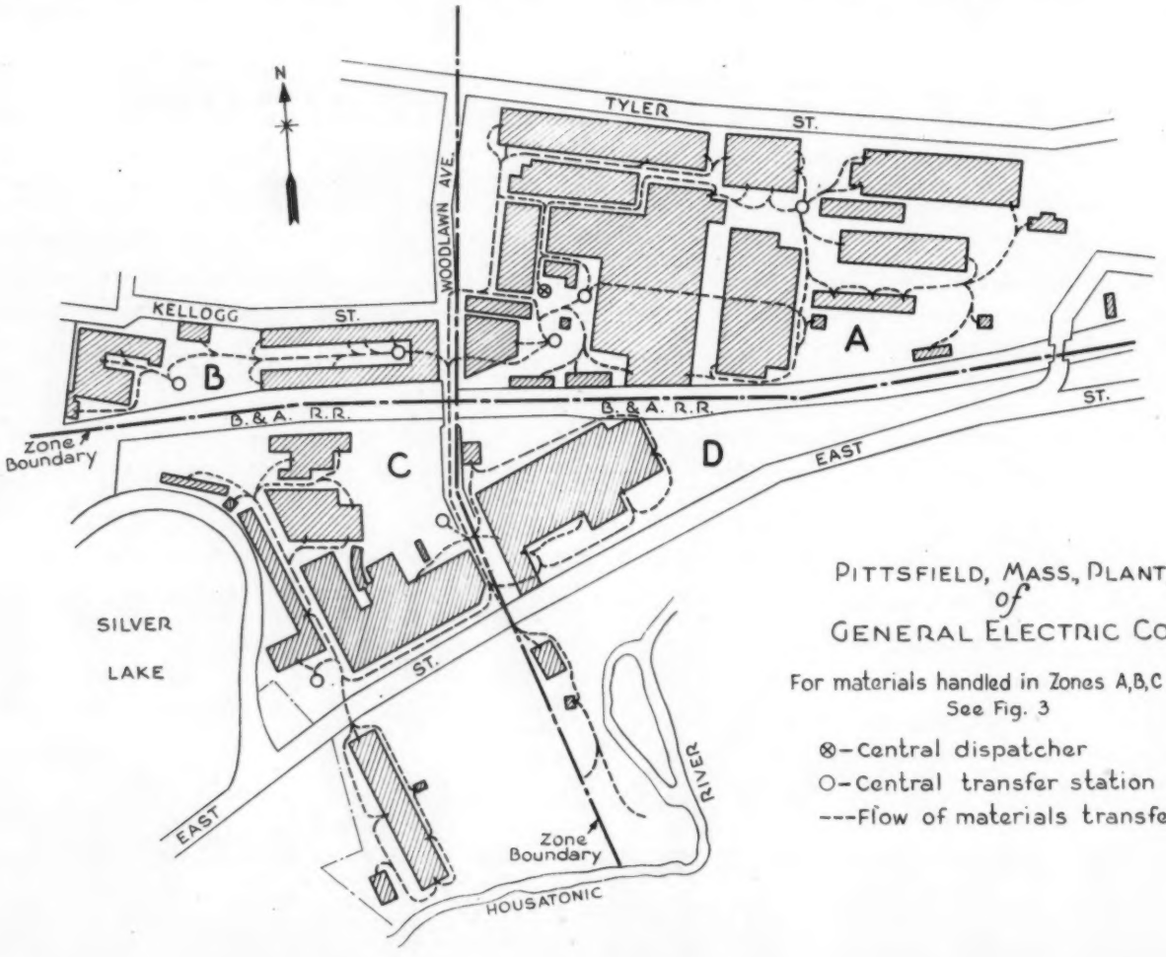
° ° °

By E. J. MILLS

Supervisor, Transportation Department, General Electric Co., Pittsfield, Mass.

° ° °

WHEN interplant movement of materials, parts and products, ranging from two ounce capacitors to 200 ton transformers, is complicated by a plant layout which, under no conceivable circumstances could ever be regarded as designed to promote efficient handling, the result is a *problem* in every sense of the word. The following discussion therefore contains two major points of interest: (1) the story of the coordination of effort entailed in arriving at an efficient and economical solution of such a problem, and (2) a description of the methods and equipment which have been found best suited to meet the particular needs thereof,



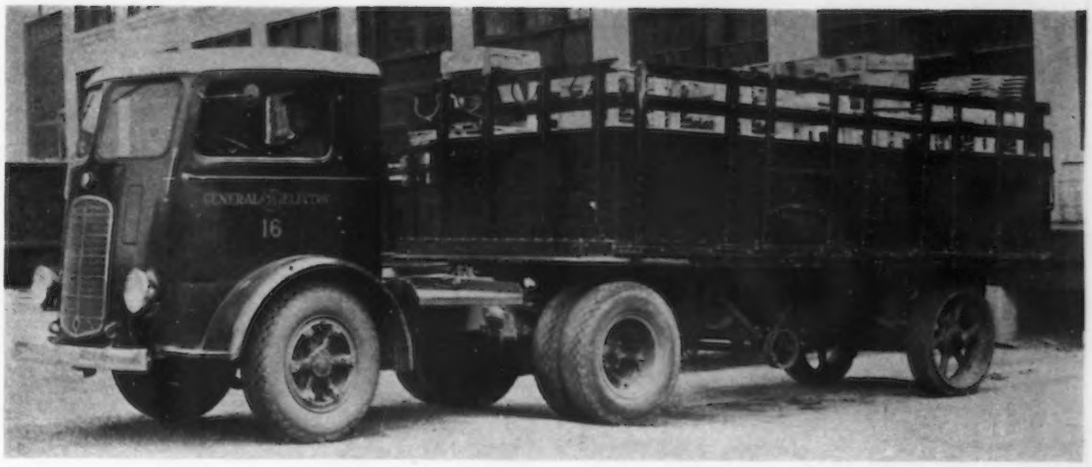


FIG. 2
SEMI-TRAILER handling finished distribution transformers from factory to warehouse.

as well as a brief summary of the most noteworthy results.

The Pittsfield, Mass., Works of the General Electric Co. grew so rapidly that long-range planning of layout was impossible. Almost as soon as new buildings were erected they were outgrown, and other buildings were necessary. Today there are 92 departments occupying 52 acres of floor space, housed in 159 different buildings spread out over 92 acres of rolling ground. The plant site is split by the main line of the Boston & Albany R. R. as well as by two heavily traveled thoroughfares. In Fig. 1 a simplified diagram of the layout is shown, indicating some of these difficulties.

In addition, with grade levels varying as much as 50 ft., equipment is constantly hauling heavy loads up 6 per cent grades, and in many locations entrance to buildings is obtained by ramps with grades of as high as 10 per cent. With several four and five-story buildings, materials handling often is dependent on the use of elevators, and considerable remodeling has been necessary to make way for larger and faster freight elevators to carry modern industrial equipment and heavier pay loads. Because of the difficult terrain, much equipment has been specially developed to cope with particular problems. The company has cooperated with equipment manufacturers in the design of tractors with special gear ratios and new fifth wheels for trailers to reduce jackknifing on grades. Much pioneer testing of solid and pneumatic tires for industrial equipment has been done. At present G.E. and the equipment manufacturers are cooperating in the design of trucks to be built with lighter alloys so that greater pay loads may be carried on low-capacity elevators and across floors with live-load limitations.

Prior to 1928 each department or division had its own men and equipment to handle materials. This system was inefficient due to the divided responsibility and waste involved in incomplete utilization of equipment, together with haphazard maintenance. In each division materials handling was just an extra job for some foreman whose primary interest was manufacturing.

THE SOLUTION

In 1928 it was decided to centralize the control of all materials-handling activities. A transportation department was created to study the problem and effect the consolidation. Preliminary surveys showed that several

FIG. 3.—ORGANIZATION CHART OF TRANSPORTATION DEPARTMENT.

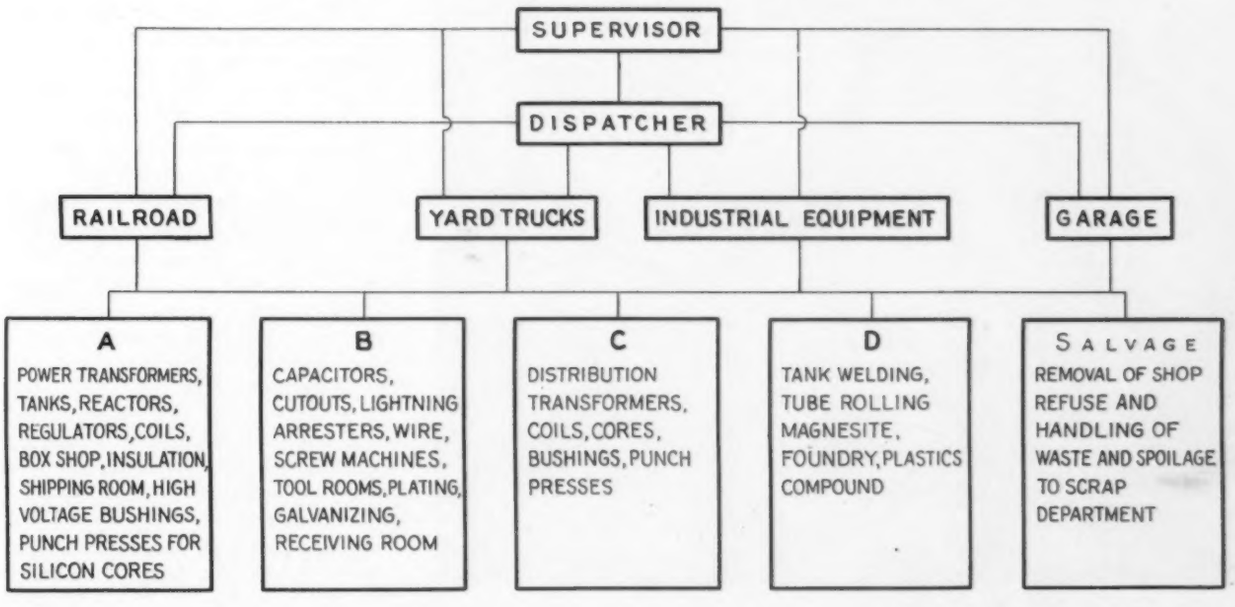

SUPERVISOR
DISPATCHER
RAILROAD
YARD TRUCKS
INDUSTRIAL EQUIPMENT
GARAGE
A
POWER TRANSFORMERS, TANKS, REACTORS, REGULATORS, COILS, BOX SHOP, INSULATION, SHIPPING ROOM, HIGH VOLTAGE BUSHINGS, PUNCH PRESSES FOR SILICON CORES
B
CAPACITORS, CUTOUTS, LIGHTNING ARRESTERS, WIRE, SCREW MACHINES, TOOL ROOMS, PLATING, GALVANIZING, RECEIVING ROOM
C
DISTRIBUTION TRANSFORMERS, COILS, CORES, BUSHINGS, PUNCH PRESSES
D
TANK WELDING, TUBE ROLLING MAGNESITE, FOUNDRY, PLASTICS COMPOUND
SALVAGE
REMOVAL OF SHOP REFUSE AND HANDLING OF WASTE AND SPOILAGE TO SCRAP DEPARTMENT

FIG. 4—AT LEFT

LOADING porcelains on semi-trailer with fork truck.

FIG. 6—AT RIGHT

HANDLING porcelains from stock to manufacturing floor with fork truck.

FIG. 5—BELOW

PORCELAINS stored by fork truck 14 boxes high, saving 30 per cent on floor space for this kind of material.

sweeping changes were necessary. One central dispatcher was appointed to handle all calls for service and to route all the equipment. This change eliminated most of the confusion involved in the old system, where several men had to be consulted if the material was passing through three or four divisions.

Next, an inspector was appointed to check the productive efficiency of each man and each piece of equipment. It was discovered that many departments did not need the full-time services of a truck and a driver, and schedules were arranged so that two or more departments could share the services of one piece of equipment. All equipment was inventoried and it was found that 60 per cent of it was inefficient because of old age, obsolescence, or improper maintenance. Old equipment was scrapped, obsolete trucks were replaced by

FIG. 7—ABOVE

RED lead palleted to be handled with fork truck.

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modern trucks designed for specialized handling, and a campaign of conscientious inspections, greasing, and preventive maintenance was instituted to keep the equipment at peak efficiency.

Handling methods were studied and it was decided to replace all highway trucks within the plant with the tractor-trailer system (Fig. 2). The change immediately resulted in fewer handlings and lower hauling costs per ton. A study of the plant's railway system—which consisted of five locomotives, miles of track, and many co-owned cars—revealed that much of its work could be done more efficiently with semi-tractors and trailers. This was a most important change. And it is even more significant that since the widespread adoption of fork trucks these trailers and semi-trailers can be used even more efficiently, due to facility of loading and unloading.

In one case, finished transformers formerly had been loaded on flat cars and hauled three miles in order to reach the warehouse which actually was but 500 feet away! This was due to the complicated switching necessary to cross the Boston & Albany tracks. The use of 10-ton semi-trailers (Fig. 2) on this job reduced the cost of handling 60 per cent and decreased the time for loading, hauling, and unloading from 24 hours to one hour. Obviously, an important aspect of this improved system has been better service to customers.

As a result of this reduction in railway hauling, it has been possible to reclaim considerable floor space formerly used for tracks within the buildings and to abandon much track and rolling stock, with an obvious saving in investment and maintenance. At present two diesel-electric switching engines and a railway

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FIG. 8—BELOW

LIGHTNING arresters and cutouts stored in warehouse by fork truck.

Fig. 9—Loading finished lightning arresters on semi-trailer.

crane have clear tracks for the handling of inbound cars of raw material and outbound cars of finished products.

No small feature of centralized materials handling has been the opportunity to cooperate with the factory layout department. The general superintendent, understanding the importance of materials handling in any manufacturing system, has made it possible to check and approve factory layouts so that the transportation department may be able to do its part in facilitating production. Furthermore, whenever the layout department decides on a move and the maintenance department starts to dismantle machinery, the transportation department is able, with its centralized control, to marshal enough equipment and men to effect the move with the minimum of lost production time.

ANALYSIS OF RESULTS

Summarizing gains from centralized control of materials handling, the following features deserve special emphasis:

1. *Consolidation for Cost Reduction:*

In the Pittsfield Works, consolidation reduced costs and equipment investment at least 30 per cent. Such a percentage is significant when one considers that at plant capacity G.E. deals with large payrolls for materials handling as well as large valuations for equipment. Further, materials handling is theoretically non-productive and efficient management demands that handling costs be rigidly controlled.

2. *Consolidation for Efficient Utilization of Equipment:*

Under divided control of handling equipment, additional trucks were often bought for busy divisions while other divisions had trucks rusting away in idleness—or working only a small percentage of the time.

Under consolidation, a transportation supervisor has the time and facilities to study all the latest developments in modern handling equipment. He has time for cooperation with the equipment manufacturers—and it pays big dividends. Progressive equipment manufacturers often have the solution to complicated handling problems.

For example, one equipment manufacturer designed a large electric tractor to cope with Pittsfield's hills, and it proved so successful that it has been used widely in other plants.

With divided control of handling, many departments were using obsolete equipment. Specialized trucks were available to handle the particular jobs, but no one was delegated to keep abreast of new designs. Trucks were kept on the job for 20 years with no thought of improvement in method. In most cases it seems that equipment development makes trucks obsolete in 10 years.

It was found that during divided control of handling activities many departments were "skimping" because the amount of work didn't justify the purchase of an expensive truck. Since the consolidation of handling, it has been possible to have one truck service several departments on schedule. This point is especially important in the utilization of fork trucks—without centralized control probably no one department would have initiated the fork truck method for some time, since the essential factor of the fork truck system is coordination of the flow of materials.

Fig. 10—Fork truck handling lightning arresters in warehouse.

Semi-trailer handling finished lightning arresters from factory to warehouse. Parked in central transportation yard.

In fact, the optimum use of fork trucks presupposes that all handlings in a series shall be properly integrated. Some specialist in the flow of materials must coordinate the handlings through the different departments to eliminate confusion and wasteful hand labor. This coordination involves the study of standardized containers to fit the material through its various stages of manufacture, the planning of factory layouts to eliminate bottle-necks in the flow of production, and the education of factory foremen in the parts they are to play in the plant-wide scheme of operations.

3. *Consolidation for Better Maintenance:* Careful inspection of equipment and preventive maintenance reduce costs and prevent losses due to delayed production. This is best done through centralized control. With the system, maintenance costs have been reduced: first, by the replacement of worn-out equipment, and, second, by careful inspections and servicing. In actual figures, *centralized control of transportation reduced annual maintenance costs from $85,000 in 1929 to $47,000 in 1937.*

IT WORKS

Probably the most potent argument for centralized control of materials handling has been its success under complicated conditions. By 1936 the General Office at Schenectady became interested in the problem of materials handling, and it was so impressed with the Pittsfield record that it steered the development of all other General Electric Works on a similar basis—with emphasis on centralized control.

EQUIPMENT USED

The materials-handling supervisor has four foremen and five group leaders to control the operation of the following pieces of equipment:

2 Diesel - electric switch engines	23 Electric tractors
1 Railway crane	5 Gasoline tractors
7 Flatcars	297 Yard trailers
5 Semi-tractors	11 Low-lift trucks
42 Semi-trailers	29 Tier-lift trucks
18 Highway trucks	5 Baggage trucks
	10 Fork trucks

ORGANIZATION OF CENTRAL MANAGEMENT

With a good organization behind him (Fig. 3) to handle routine, the supervisor finds it possible to spend more time on cost control, development of new methods, interchange of ideas with other General Electric supervisors, and cooperation with the factory planning department.

Since his telephone connects him with ninety-two departments requiring diversified services and 448 pieces of transportation equipment ready to do the job, the dispatcher really is the nerve center of the system. Cooperating with him are the foremen in charge of the railroad, industrial equipment, and garage, and the group leaders who maintain schedules in five sections of the Works.

The staff is knit together by weekly meetings, at which the supervisor leads discussions on handling problems. Many important changes in methods have been inspired by these forums.

EXAMPLES OF RESULTS

After thorough consideration of these factors and preliminary studies through use of one truck, lightning-arrester handling was put on a 100 per cent fork-truck basis to test the system in a complete cycle of opera-

(CONTINUED ON PAGE 50)

Fig. 12—Pittsfield works dispatcher instructing tractor drivers.

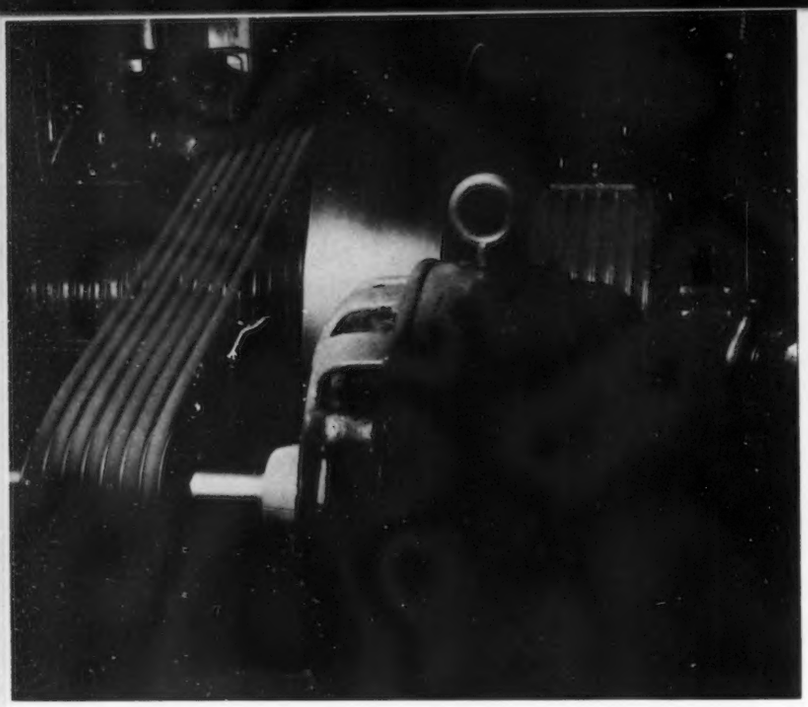

FIG. 1—A seven strand Gilmer V-belt drive furnishing smooth, dependable power transmission from a motor to a compressor in a textile mill.

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The How and Why of V-Belt Drives

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By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

o o o

CHAPTER 36 of a Series on the Economics of Industrial Power Transmission.

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THERE are several important differences between V-belt drives and flat belt drives. Some of these differences are so marked that the design theories vary quite radically in each case. It will be of interest, therefore, to approach the subject of V-belt drives by way of a comparison of design theories.

A flat belt transmits power by virtue of the grip of its contact surface with the face of the pulley. This grip is a function of the coefficient of friction between the contact surface of the belt and the face of the pulley, and of the tension in the belt which holds these surfaces together. In the V-belt, the term coefficient of friction is meaningless. The bottom surface of the belt never touches the bottom of the pulley groove; the grip of belt and pulley is wholly dependent upon the wedging action of the *sides* of the belt within the pulley groove.

Now, this wedging action is not the simple thing that it would be if the belt were a solid bar of metal of trapezoidal shape, operating within a conical groove. If the belt were such a solid bar of metal, wedged under the tension of the drive within the pulley groove, it would require the action of considerable force to *un*wedge, or free it from the groove after passing around the pulley. Under such circumstances it is readily apparent that a V-belt drive would waste almost as much power as it transmitted, in the continual effort to unwedge the belt. Fortunately, the V-belt is *not* a solid piece of metal. It is a very limber and flexible piece of rubber and canvas and cord. And in this flexibility lies the whole secret of its applicability as a power transmitting medium.

Hold one of your fingers out straight and look down upon it from above. The lines bounding the digit at either side are practically parallel. Now flex the end of the finger downward, at the knuckle. Immediately, as you observe the action from above, the flesh around the knuckle joint bulges outward at either side. This is what happens to a V-belt when it passes around a pulley. As the belt runs from one pulley to the other, the sides are parallel, like the sides of your finger; but as the belt enters the pulley groove and begins to bend around the pulley, the sides of the belt bulge outward, meet the corresponding sides of the groove, and wedge there.

Within the groove of the pulley,

FIG. 2—A six strand Dayton cog-belt drive operating within a metal guard connects a motor in the base to the gear-head of this American tool-room lathe.

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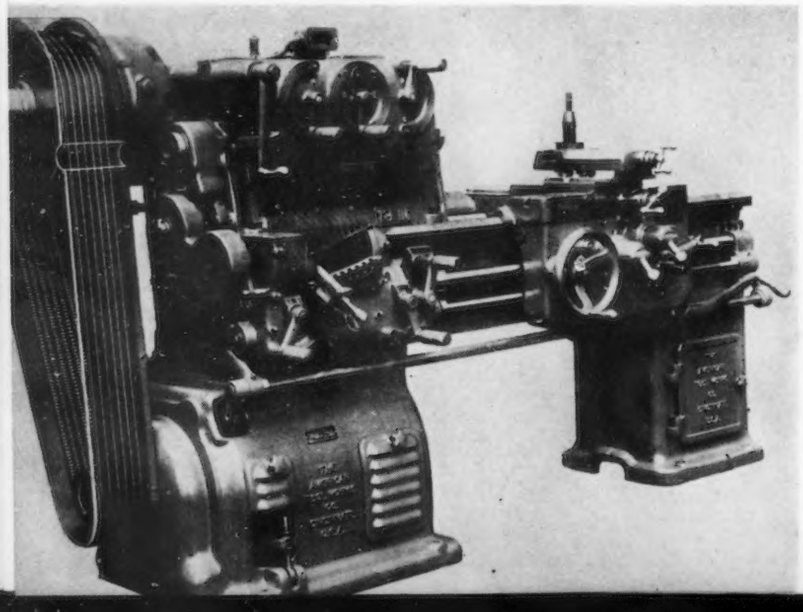

therefore, these side-bulges of the belt form the surfaces of belt contact with the sides of the groove. The tighter the belt tension and the sharper the bend of the belt, the greater is the wedging action, *on these bulges.* Herein lies the element of positive grip so frequently claimed as one of the chief advantages of V-belt drives. Within the limitations of the proper load a V-belt is designed to carry, this positive grip, the result of the wedging action, is undoubtedly greater than the grip attained in any type of flat belt.

At the point of leaving the pulley groove and at the beginning of the straight run of the belt to the other pulley, the belt unflexes, and the bulges disappear. As a consequence the belt leaves the groove freely and easily, the unwedging action being helped materially by the reduction of the bulges. It is due to this factor that power losses at this point, caused by the breaking of the wedge effect of the belt in the groove, are reduced to an almost inappreciable minimum.

It should be noted, however, that there is one type of V-belt made with sides which are concave when the belt is running straight. As this type of belt passes around the pulley the bulge effect merely causes these sides to become perfectly straight, so that the entire side of the belt makes contact with the pulley groove instead of merely that portion of the side which is most largely bulged out. Hence we have a condition where the economic effect of uniform wear over the whole area of both sides of the belt instead of over a portion of the area of both sides must be balanced against the undoubted power losses which occur due to the greater difficulty of freeing the belt from the wedging action of the groove after it has passed around the pulley. There are cogent arguments on both sides, but it is interesting to note that the great majority of V-belts are made with straight sides in order to take advantage of the bulge.

Two Other Differences

A second vital difference between flat belts and V-belts lies in the fact that, due to the wedging action which takes place between the V-belt sides and the pulley grooves, a much smaller arc of contact around the pulley is required to maintain grip, than is needed for a competent "wrap" of the flat belt around the flat pulley face. As a direct consequence of this fact, the V-belt drive is ideally suited for short center distances; and in fact may be applied to a situation where the center distance is little, if any, greater than the diameter of the larger pulley, even when the speed reduction or increase ratio is high. Within the limitations of the proper loading of the V-belt drive, slip should be considerably less than with the flat belt drive.

A third vital difference between flat belts and V-belts appears in the consideration that the flat belt is one homogeneous structure across its entire width; the tension stresses in the belt being equalized over that width. In the multiple V-belt the width of the drive is actually split up into a number of separate belts, each more resilient than the single flat belt; requiring a careful matching of individual tensions to assure a uniform pull over the entire drive width.

As a result of these differences (and the resulting consequences) the V-belt drive (which for most practical purposes insofar as industrial power transmission is concerned, really means the "multiple V-belt drive") is, properly designed, installed and maintained, a compact and economical method of transmitting power from a motor to the operating shafts of various types of machines. Within speed reduction or increase ratios of from 1 to 1, to 1 to 7 (or 7 to 1), on medium to short centers, it is today a popular method of connecting a motor to the individually motor-driven machine. It is rarely used on long center drives, or to drive lines of shafting, or to drive machines from lineshafting. Operating conditions involving excessive heat, the presence of oils or corrosive chemicals, long center distances, large velocity ratios, and extremely high speeds should receive special consideration, and the respective advantages of flat belt and V-belt drives weighed

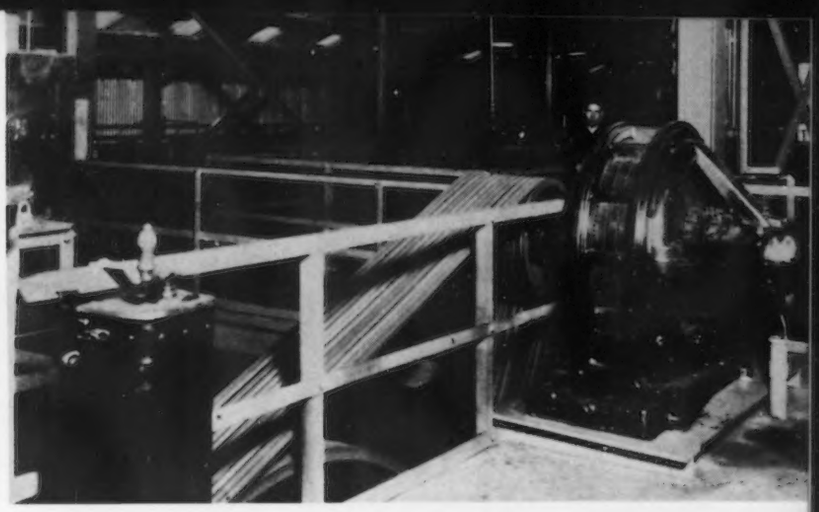

FIG. 3—A 12 strand Allis-Chalmers texrope drive transmitting power under heavy duty conditions from a 150 hp. motor to a raw coal conveyor.

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FIG. 4—A 13 strand Gilmer V-belt drive delivers 140 hp. from a diesel engine to a general utility generator in a manufacturing plant.

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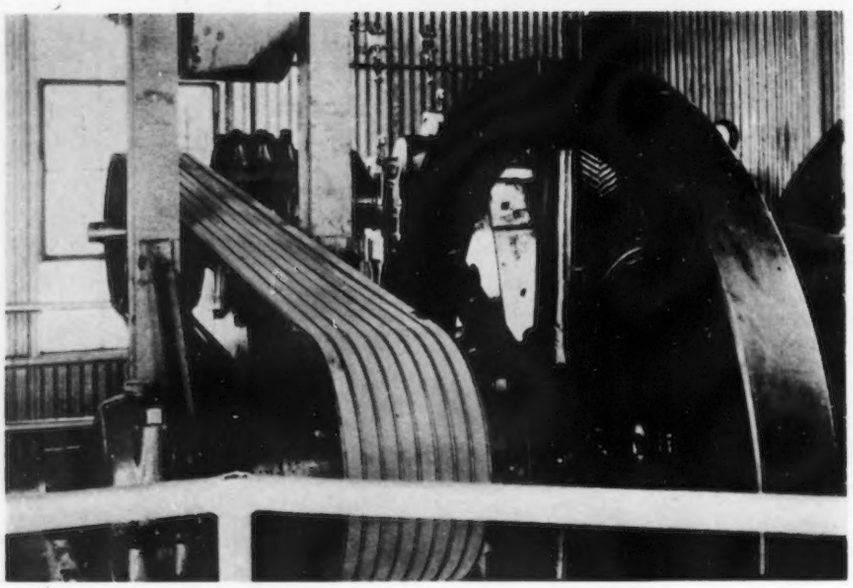

FIG. 5—An eight strand Manhattan Rubber condor V-belt drive operating a Goulds triplex pump used for water flooding an oil well in the mid-continent field.

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with the utmost care before a decision is reached.

V-Belt Advantages

V-belt drives have become popular because of certain specific advantages. These advantages are in many respects closely tied to natural limitations, but within these limitations are wide and generous. V-belt drives are used today all the way from fractional horsepower drives on household equipment to drives of 1000 horsepower in the heavy industries. Because of their inherent characteristics of cleanliness, they are widely used in the food industries and in textile mills; because of their ability to withstand conditions of dirt, gritty dust and moisture they are equally widely used in the ceramic, cement and mining industries. Where quiet operation is a necessity they are popular in public buildings and institutions, as on ventilating and air-conditioning services; and in the blast furnace, the steel rolling mill, the automobile plant and the machine shop their short-center capabilities have found wide applications. These qualities, too, have found appreciation in such diverse industries as agriculture and oil-production, lumber and metal-finishing.

What are these advantages in detail, and their limitations?

First and foremost is grip, or pulling power. Of all resilient-type drives, the V-belt comes closest, under normal conditions of load, to the standpoint of positive transmission of power. Because of the wedging action of the belt in the pulley groove, the harder the pull, the tighter the grip. The natural limitation is, of course, the strength of the component parts of the belt. Continued high tension weakens the fibres of the fabric and the cords. The drive should, therefore, be designed to keep the individual belt tensions within reasonable load limits.

Second, space saving. The V-belt is essentially a short center drive, and under extremely short center conditions is the most successful resilient type drive. Since it permits the motor to be set much closer to the machine shaft than any other type of belt drive, this advantage is of great importance to the equipment manufacturer. It is the most popular drive for machine tools, for example. The actual limitation is a center distance equivalent to the diameter of the larger pulley.

Third, its capacity may be graded through an almost infinite number of steps. As one V-belt manufacturer says in his advertising, "It may be designed to be as delicate as a doe in handling sensitive jobs, or as rugged as a hippopotamus for jobs requiring brute strength." From the single V-belt for fractional horsepower transmission to the 24 or more strand drive for heavy loads, the range is exceptionally gradual. A limitation occurs in the many-strand drive due to the leverage of a very wide pulley exerted on the motor bearing, unless the pulley is supported also by an outboard bearing.

Fourth, the V-belt drive is inherently quiet. When flat belts slip, there

FIG. 6—Two 14 strand Allis-Chalmers texrope drives connecting a 250 hp., 440 r.p.m. motor to 122 r.p.m. pulp beaters through 84-in. centers.

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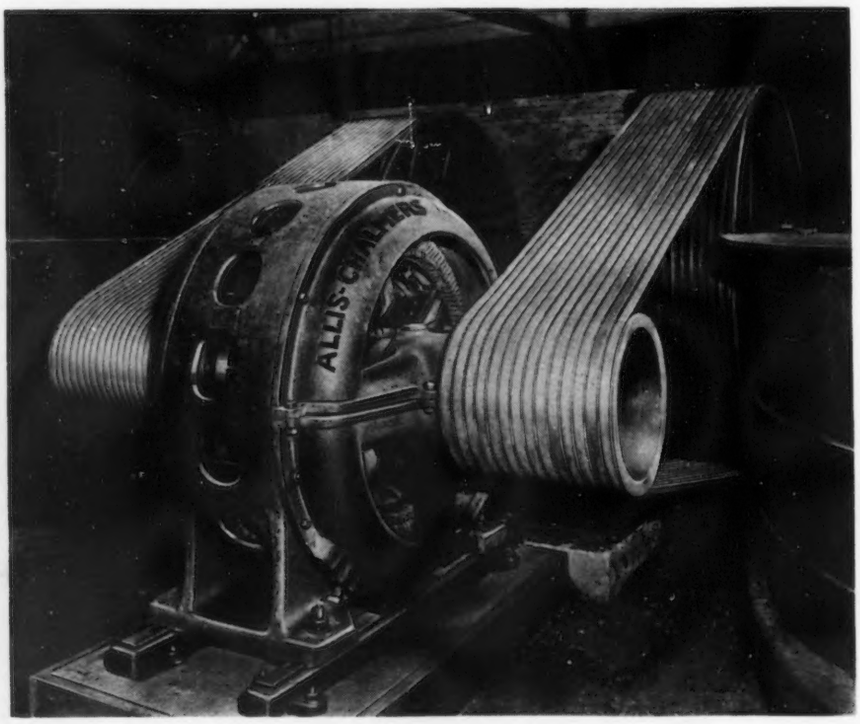

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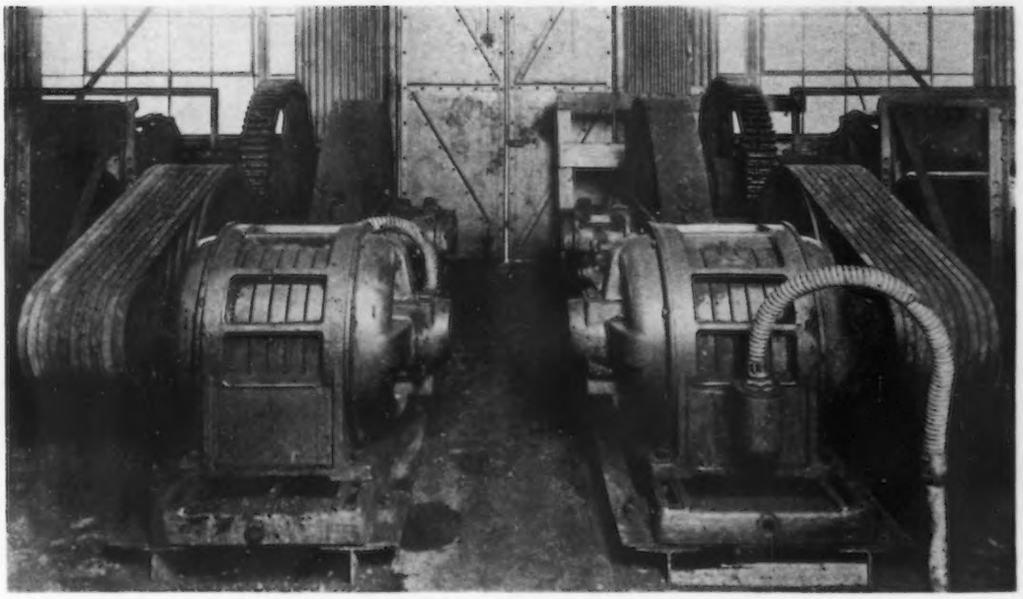
FIG. 7—These 10 strand Dayton cog-belt drives connect 575 r.p.m., 75 hp. motors to heavy belt elevators through spur gear reduction drives.



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is noise; with excessive slip that noise becomes a squeal. V-belts, properly alined, do not squeal when slipping. The joints or splices on flat belts make a flapping sound when touching the pulleys. V-belts, always manufactured endless, do not flap.

Fifth, the V-belt is inherently clean. No belt dressings should ever be applied to them, consequently the belts do not become sticky nor do they collect oil or grease, or greasy dust.

Sixth, V-belt drives cushion the shock loads. They start smoothly and run smoothly because, by their very nature, they are highly resilient. As a result both of this resilient characteristic and of the wedge-grip on the pulley, a properly proportioned and adequately installed V-belt drive should not require high tension for satisfactory operation; hence should impose light loads on the shaft bearings. When a V-belt drive requires high tensions to prevent excessive slip, it is a sign either that the load is too heavy for the drive, or that the natural life of the belts under load is being exceeded.

General Criticisms

Among belt users the general criticisms most often heard of V-belt drives indicate that such drives are primarily adapted to short center operation at speeds not greatly in excess of 3500 ft. per min. of belt travel, that they should be used on heavier drives only when the sheaves are large and belt speeds moderate, and that unless the newer synthetic rubber compounds are used in manufacturing the belts, they should not be used under conditions where oil is present, either as drip, mist, spray, or as seepage from an unprotected bearing.

V-belts of whatever material are intermediate between the flat belt and the chain drive with respect to the care required in pulley alinements. Pulleys must be more carefully alined originally than with flat belts, and must be kept in excellent alinement, to operate satisfactorily. Not quite so much care, however, is required in this respect as with chain drives. But any considerable departure from parallelism between the driving and driven shafts will produce inequality of load division between the belts, while any lateral pulley misalinement will produce excessive sidewear on the belts and shorten belt life. Such lateral misalinement often does produce squeaky V-belt operation.

When used for long center distance drives, especially if the belt speed is

FIG. 8—A 21 strand Dayton V-flat drive connecting a high-powered synchronous motor to an ice-plant compressor. Note the flat-surfaced compressor pulley.

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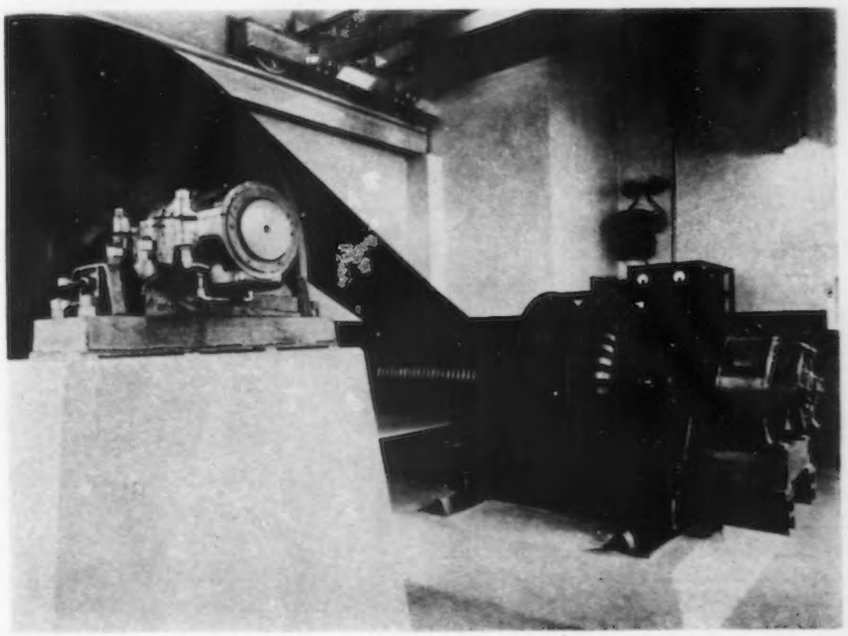


high, or the slightest pulley misalinement exists, the V-belts tend to climb out of their grooves and run on top of adjoining belts, or occasionally to roll over and run on their sides.

There is no particular overload capacity in the V-belt drive. Flat leather belting, unless seriously overrated, will carry a considerable increase in load with no more difficulty than a high increase in slip; but V-belts when overloaded are definitely weakened in structure. Overload capacity can only be provided for by the proportional provision of more belts. Manufacturers recognized this at an early stage in the development of the V-belt drive by their practice of recommending an increase in the number of belts to take care of small pulley diameters, speed-up drives, unusual load fluctuations and other unfavorable factors. The basic ratings which represent belt capacity under favorable conditions remain unchanged, but the service factors applied to these ratings to accommodate unfavorable operating conditions will cause the actual number of belts to be installed on a drive to be much greater than the basic catalogue recommendations.

V-belts cannot be operated on fixed centers. Much of the initial stretch comes out in the first few hours or days of running. Thereafter there is a gradual elongation, particularly under heavy loads, throughout the life of the belt. Since the belts cannot be cut and spliced or otherwise rejoined on the job, there must be some means provided for belt take-up. This take-up is usually allowed for as at least 10 per cent of the nominal center distance.

Since V-belts must be made endless by the manufacturer, they are not obtainable in all desired lengths. Consequently the drives must be designed to use stock sizes of V-belts. Sometimes this requires considerable juggling of the diameters of both driving and driven pulleys as well as of the center distance.

On drives of considerable capacity the inherent stiffness of the larger sizes of V-belts precludes the use of small diameter pulleys. When small diameter pulleys *must* be used, the alternative is a very large number of light V-belts on a very wide grooved pulley. Unless such wide pulleys can be supported with an outboard bearing, the center of the belt group is thrown far out beyond the motor bearing, and the resultant leverage may increase the motor bearing load beyond the manufacturer's recommended load limits.

Likewise, for heavy capacity drives a serious V-belt limitation is high speed. The individual belts are generally thicker than a corresponding flat belt, and since at a given speed the centrifugal force varies as the weight of the belt, the effect of that force will be felt in correspondingly greater measure in the V-belt drive. At the higher speeds of heavy capacity drives, the combined effect of belt stiffness and centrifugal force tends to lift the belts out of the pulley grooves for a considerable distance from what should be the entering and leaving points. Under these conditions slip is excessive, and if tension is increased to cut down the slip, the belts quickly stretch beyond all usefulness.

Analysis of these criticisms shows that V-belts are unsatisfactory in applications where they should *not* be used. But that is true of any type of drive. No single type of industrial power transmission equipment is a panacea.

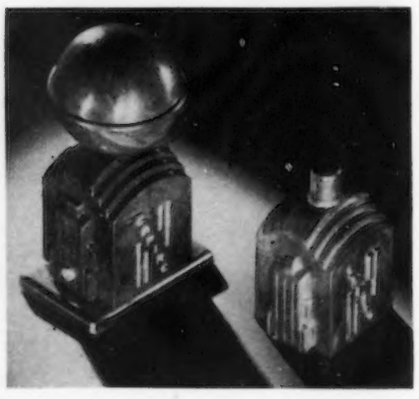
A brief description of V-belt shapes and materials was given in Chapter 29, The Characteristics of Industrial Transmission Belting. A similar description of V-belt pulleys, or sheaves, will be given in later chapters dealing with the characteristics of transmission pulleys.

Here it is important to note that a development of the V-belt drive which is of increasing interest is the so-called "V-flat drive." When a small motor pulley is to drive a large driven pulley at short center distance, the large pulley may be flat-faced, the V-belts riding over the flat surface of the face just as a flat belt would. The small motor pulley is, of course, the usual grooved V-belt type. This drive is a cross between the true V-belt drive and the flat belt drive, in which the V-belt advantages of positive grip and small contact angle are combined with the economy of using an existing flat-face driven pulley, under conditions which might make a short-center flat belt drive unsatisfactory.

Injection Molding Over Die Cast Cores

THE plastic industry continues to find new uses for metal die cast cores and inserts. They are particularly adaptable to injection molding, a process by which the plastic is heated to flow point and then squirted, or injected by pressure, into the mold around the metal core. By coating the castings with plastic, metal finishing operations are eliminated and color is added to the product. In turn, the metal gives additional rigidity to the plastic and, in many applications, desirable weight.

A recent example of the process just described is the Empire hand stamp. Tenite, a cellulose acetate plastic, is injection molded over a die cast metal core like the one shown at the left in the illustration. The coating is less than 1/8 in. thick and provides a lustrous plastic finish. Here the die cast core gives desirable weight and rigidity.



The round knob on the finished stamp is of matching Tenite, molded in two parts which are then cemented together. To provide it with some means of attachment to the body of the stamp, the lower half of the knob is molded around a threaded metal insert. This is then screwed onto the post of the metal die casting which is threaded before assembly.

Composite Construction in Heavy Welded Assemblies*

By W. E. HOLLINGSHEAD

Engineering Department,
S. Morgan Smith Co., York, Pa.

WHEN considering the individual parts which must be incorporated to complete a structure, the designer is faced with the task of selecting from structural shapes, plates, forgings, stampings and castings. In the construction of heavy and complicated machinery, this selection is especially important. Often when it has been decided to weld fabricate instead of cast, the possibility of combining structural shapes and castings is overlooked. While there is no set rule where this combination is advisable, it may be said that composite construction is advantageous where expensive forming equipment and pressing or forming operations would be required if rolled steel alone were used, or where there are surface irregularities or contours which would, if fabricated, be unnecessarily expensive. One of the more frequent uses of castings in composite construction is in bearing housings of massive shape or heavy section.

Properties Are Similar

The designer and manufacturer need have no hesitancy in using composite construction, considering that available steel castings have physical and chemical properties which closely approximate the properties of rolled plate. It is, however, true that a casting with a chemical composition similar to a rolled plate will have lower physical properties than the plate.

In the examples of composite construction which are to follow, the steel castings are A.S.T.M. specification A-27-36, grade "B1" as modified with 0.25 per cent carbon maximum. The plates used are low carbon welding quality steel similar to A.S.T.M. specifications, with tensile strengths from 45,000 to 65,000 lb. per sq. in., and yield points from 24,000 to 33,000 lb. per sq. in.

It is an established fact that the grain structure of both cast and plate steel near the welding zone is changed by the welding process. It is also well known that proper heat treatment will correct the metallurgical structure and also relieve the stresses caused by welding to a degree which is acceptable by the industry. This final heat treatment, in most cases, amounts to

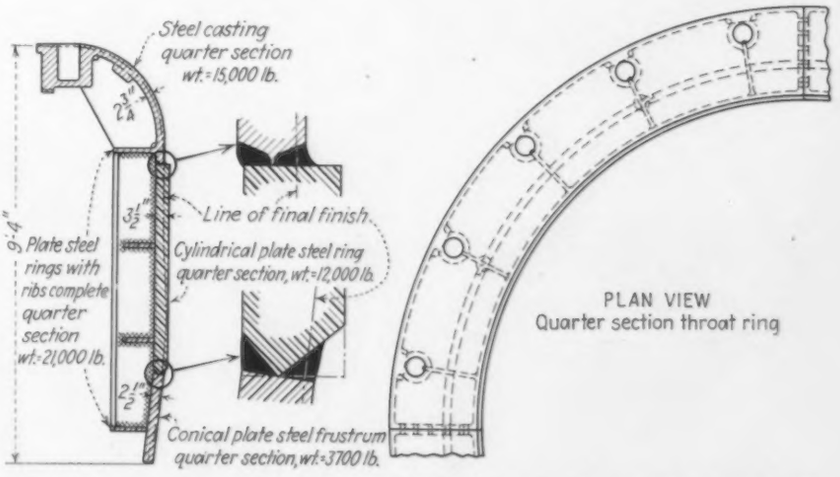


FIG. 1—This sketch of a unit of an adjustable blade turbine illustrates the economies that may be realized by judiciously combining cast steel and rolled steel. The employment of castings in the construction of this unit reduced the number of pieces required by 60.

* Abstract of a paper read before the Philadelphia Chapter, American Welding Society.

stress relieving at from 1150 to 1200 deg. F.

Preparation of Joints

The preparation of the joints for welding is very much the same for both castings and plates. In larger sections machine chamfers of the "U" or "J" types are usually advisable to facilitate assembling and to reduce weld areas. With castings, the chamfers may be also gas cut, chipped, or cast. If the chamfers are cast, or if a fillet weld is sufficient, it is considered good practice to grind the casting to bright metal where the weld is to be made.

Composite Construction Reduces Cost

A good example of the use of heavy steel castings in a welded assembly is shown in Fig. 1. This is a unit of the Smith-Kaplan adjustable blade turbines now under construction at the S. Morgan Smith plant for the T.V.A. The overall dimensions of this unit in the rough are 28 ft. outside diameter, by 21 ft., 9½ in. inside diameter, with an overall height of 9 ft. 5 in The outermost part of this section, where the 20 lower bearings for the wicket gates are located, is of cast steel welded in place. The entire ring is built in four sections which are bolted together. The weight of the castings required for the complete ring is 60,000 lb., as compared with a total rough weight of 144,000 lb. for the complete throat ring. The function of this unit of a turbine is not essentially a main strength member, but rigidity and absence of vibration are very important factors. From a hydraulic point of view, the inside contours are of utmost importance. It is apparent that had a casting not been used in the assembly as shown, it would have been necessary to have substituted four or five segments of plate of 2½ in. thickness per quarter section, which would be formed to the double curvature shown. The cost of the pressing dies and the forming, together with the gas-cut trimming and fitting, and subsequent welding of the segmental joints, would be excessive. In addition, there would be the problem of providing for the individual bearings for the lower gate stems. The possibility of excessive warpage and the cumulative errors in assembling would be increased perhaps so much that additional allowance for finish would be required. There would also be more shop handling for positioning welds. By using a casting in the assembly, the number of individual pieces was reduced by 60 per ring, the shop time was cut considerably and there was no difficulty in securing the desired shape. The cost comparison favored the use of a casting.

No Additional Machining Allowance Required

It is interesting to note that previous experience with this type of heavy structure indicated that the stock allowance for machining would be no less if we had used the pressed plates instead of the casting.

Another example where composite construction is used in turbine parts is in the Francis turbine runner, shown in Fig. 2. This runner is composed of a pre-machined cast steel crown weighing 6500 lb., and a pre-machined cast steel band weighing 5800 lb., together with 12 hot formed runner buckets of ⅞ in. steel plates weighing 7000 lb., making a total weight for the entire unit of 19,300 lb. By using plates for the construction of the buckets it was possible to obtain sufficient strength with thinner material than would have been obtained had the buckets been cast. The use of the thinner material increased the vent or cross-sectional area of the water passages, thus increasing the turbine output. The pre-machining of the crown and band to exact size and shape and to a smooth surface not only allows for more perfect assembly

AT LEFT

FIG. 2—In this example of composite construction, as applied to a turbine runner, the utilization of plates in building the buckets permitted the use of thinner material than would have been the case had castings been used.

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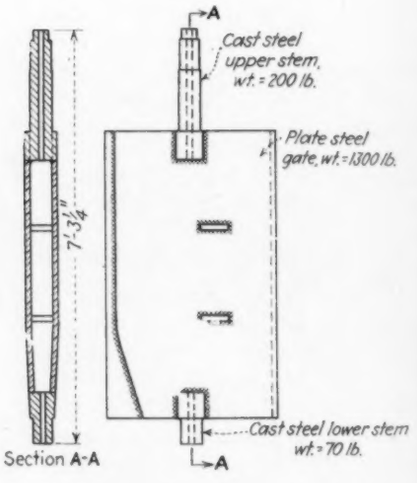
FIG. 3—The use of composite construction in the wicket gate illustrated in this drawing gave a much lighter finished product than could have been obtained had the entire gate been cast. The cost of both types was about equal.



of the runner buckets, but also produces a better balanced runner.

Casting Previously Used

Before welding was availab'e this type of runner was most frequently made in one solid casting, using cores for all of the mold excepting the crown and hub structure. The castings required when composite construction was utilized in building the runner were much simpler to make, the cost was considerably less and the possibility of having to build up, chip and grind for the ba'ancing of the runner buckets was avoided.

Fig. 3 shows a fabricated wicket gate or adjustable guide vane which employs the use of formed plates for the gate proper and castings for the gate stems. An entire gate of cast steel would be acceptable here, although the gate as shown is somewhat lighter than would have been the case if it had been cast. The cost would have been about equal in both cases. By using a composite construction, however, it was possible to utilize our present shop equipment and keep most of this work in our own plant. Pressing dies were required for the side wa'ls, but in this case the die cost was spread over 36 gates, the same as the pattern cost would have been. The surfaces on the castings which were to be welded to the plate were bossed ⅛ in. high and ground to bright metal at the foundry. Here is a case where the use of composite construction enabled us to perform the work with existing shop equipment and thus keep the work in our own organization with no additional cost.

While in many cases where it would be possible to completely fabricate with structural shapes and plates, the result might be unpleasing to the eye and the cost would probably be out of proportion to what it should have been, had some castings been used. Unless all of the available materials for construction, including castings, are considered, manufacturers and fabricators are overlooking important factors in sound and economical designs. While these examples illustrated here show some of the uses of composite construction in turbine work, they are not conclusive as the design of each individual structure presents its own problem.

Bridgeport Brass Co. Completes New Mill

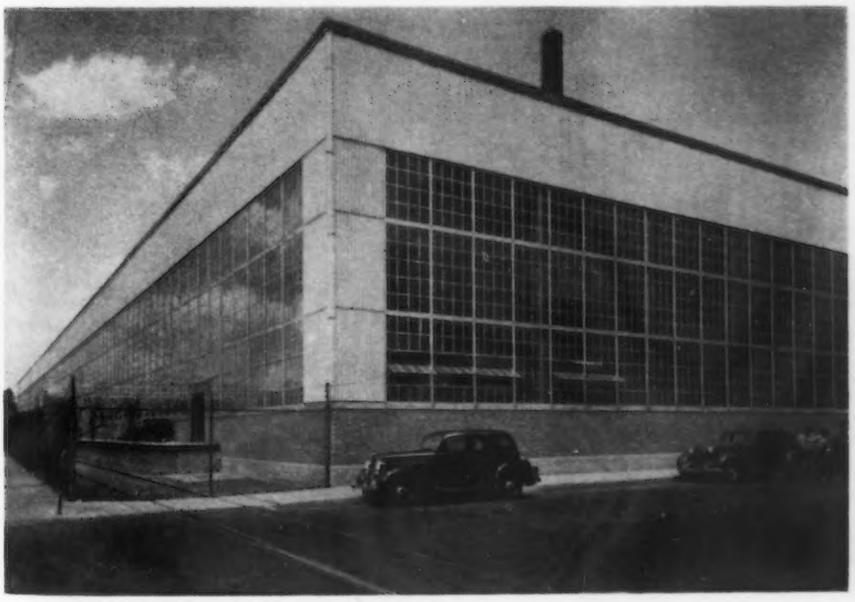
COMPLETION of its new rolling mill at Bridgeport, Conn., for production of brass, copper and copper-base alloys for industrial and commercial use has been announced by the Bridgeport Brass Co.

Built at a cost of more than $4,500,000, the new plant, in which all rolling mill operations of the company will be located, is the first major step in an expansion and modernization program inaugurated in 1937, according to Ralph E. Day, president and general manager.

The plant, utilizing the straight-line production principle similar to that employed in other major industries, has a total floor area of more than 220,000 sq. ft. and is the largest single unit of the 34 major buildings maintained by the company at Bridgeport. It is estimated that the new mill will have a production capacity of over 6,000,000 lb. of metal per month.

A new mill office and laboratory building houses all research development and testing facilities of the company. Approximately nine acres of ground were acquired for construction of the rolling mill and the office and laboratory building. Stone & Webster Engineering Corp., Boston, developed the design, constructed both buildings and installed equipment. The Morgan Construction Co., Worcester, Mass., were the consulting engineers, working in conjunction with company engineers, on the development of the rol!ing mill equipment.

More than 1375 tons of structural steel was used in the construction of the rolling mill and the unbroken window area on the four sides of the building amounts to approximately 50,000 sq. ft.



New Scrap Trading Company Organized in Pittsburgh

PITTSBURGH.—The Steel Trading Corp., with offices in the Clark Building here, has been organized to deal in new and used iron, steel and nonferrous products in both domestic and export trade. H. L. Berkman is president; Max Meltzer, vice-president, and Louis Berkman, secretary and treasurer. Mr. Meltzer has had his own company, the Max Meltzer Co. for many years. H. L. Berkman and Louis Berkman are of the Louis Berkman Co., which has been long engaged in the scrap trade at Steubenville, Ohio.

Recent Design Advances in Presses

By FRANK J. OLIVER
Associate Editor, The Iron Age

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WHAT is believed to be the largest bending press in the world, both as to size and capacity, has recently been installed by the *Baldwin-Southwark Corp.*, Philadelphia. Of 6000-ton capacity, it is capable of cold bending boiler plate up to 40 ft. in length and 8 in. in thickness. It is installed in the Hedges-Walsh-Weidner Division of *Combustion Engineering Co., Inc.*, at Chattanooga, Tenn.

The bending press consists of two 3000-ton, four-post hydraulic presses connected by two built-up bending beams 52 ft. long., 15 ft. deep and 20 in. thick. These bending beams are both above and below the foundation line, the bottom beam resting on the cast steel platen of each press. The top beam has a travel of 5 ft. The two presses have 50-in. diameter rams, operating under 3000-lb. pressure. On each side there are four push-back rams arranged for high speed work, and under the bottom die there are four manipulating rams for handling the work.

Unique features in the design of the presses are the equalizing arrangement of the pressure on both main cylinders to take eccentric loading, and also the special swiveling and thrust block device on the moving beam, permitting eccentric loading without throwing any side strains on either press. Only the working parts are placed above ground, the overflow and pneumatic filling tanks, intensifier, etc., being below floor level. The press is served by a plate heating furnace capable of taking plate 14 ft. wide and 45 ft. long.

Large Inclinable Press

ANOTHER large piece of equipment for its type is a new size Master Series A inclinable press with a 6½-in. diameter crankshaft, made

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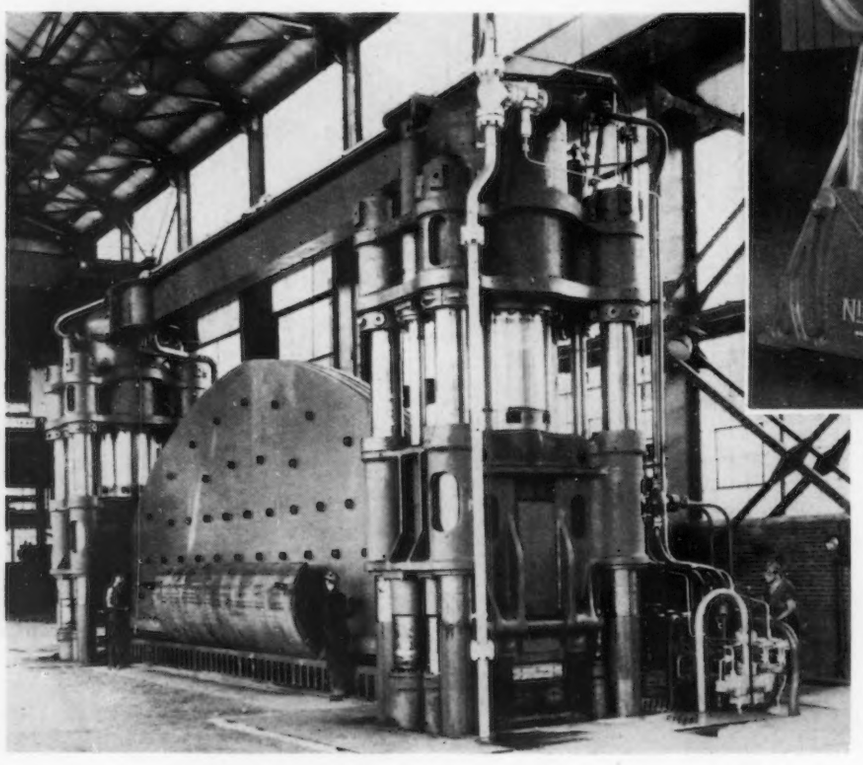
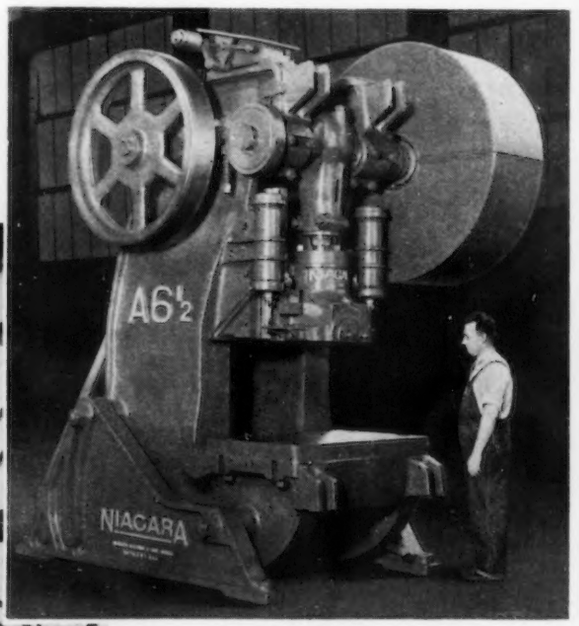
BELOW

THIS huge Baldwin-Southwark bending press, weighing 1000 tons, was recently installed in a Combustion Engineering Co. plant. It is capable of bending plates 40 ft. in length and 8 in. thick into semi-circular shapes for high pressure drums.





ABOVE

PROVISION is made for individual motor drive for this large size Niagara inclinable press with 6½-in. crankshaft.

and Other Sheet Metal Machinery

by *Niagara Machine & Tool Works*, Buffalo. The complete line in this series now extends from 1½ in. up to this size. Included in the engineering features of the 6½-in. machine are two air counterbalances connected to the slide; heavy duty 14-point engagement sleeve clutch with built-in single-stroke mechanism; rigid cast steel frame; one-man inclining device equipped with anti-friction bearings; adjustable and removable gibs, with multiple V-ways; breech block die clamp; and self-contained back gear assembly with anti-friction bearings, mounted within the frame. Main shaft bearings are split at a 45-deg. angle.

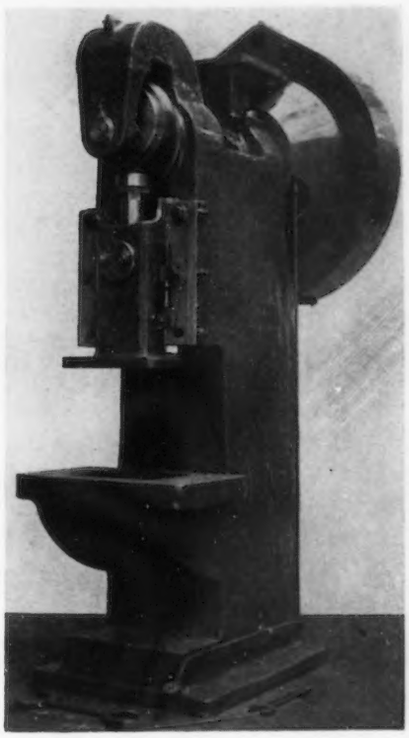
THE world's largest bending press is described in this digest of announcements of the manufacturers received in recent weeks, also a large size inclinable press, a new line of punching presses and two types of column type presses of large size. Several punch press accessories are also mentioned. Advances in design of hydraulic equipment include a compact, streamlined assembly press, a high speed general purpose press, a bench type and a special dual cylinder construction for an automotive application. Two machines for forming Pittsburgh locks in sheet metal joints are illustrated, as well as a nibbling type of machine for cutting intricate shapes in sheets.

Punch Presses

A MODERN line of punch presses has been developed by *Ferracute Machine Co.*, Bridgeton, N. J. In appearance they are moderately streamlined and utilize much less floor space than the former conventional design. Frames are high quality steel castings, designed to give maximum strength and rigidity. Crankshafts, pitman stems, and couplings are heat treated, and the shaft is supported by an overhanging bearing that forms part of the main frame casting. Frame journals are bushed with a high grade bronze, as are other important bearing members. Rams are extra long, and the ram bearings are bronze lined to give long wear. The presses are equipped with either a direct or V-belt drive, and gears and flywheel are inclosed in suitable sheet metal guards.

Four-Point Press

OPPOSED motion rocker shafts running from front to back and actuated by eccentrics are featured in the No. 4L-7½ 84-in. lever type four-point press developed by *E. W. Bliss Co.*, Toledo, for blanking and shallow forming work. Thrusts are distributed equally over the gibs under all loading conditions, it is stated. The main outer links straddle the outer web of the crown and transmit the load as a direct thrust through the web. Due to the linkage, a slight



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A SPECIAL casting process is used to give a smooth finish to the redesigned frames of a new line of Ferracute punching presses.

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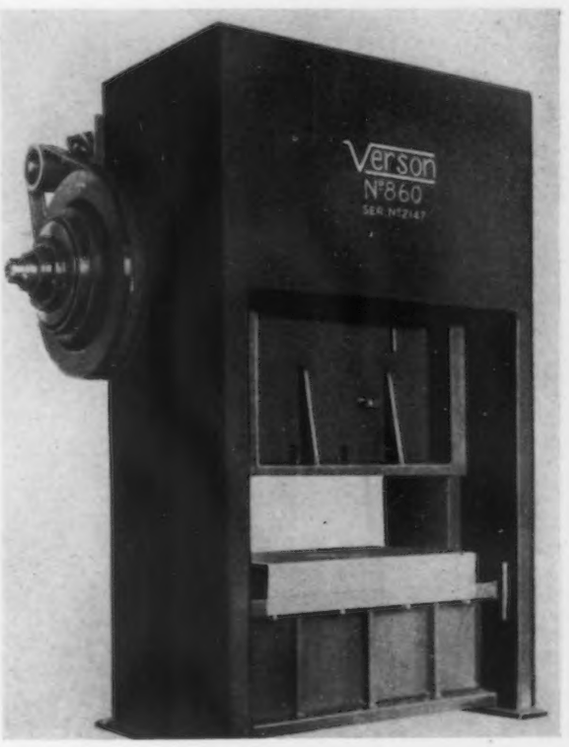
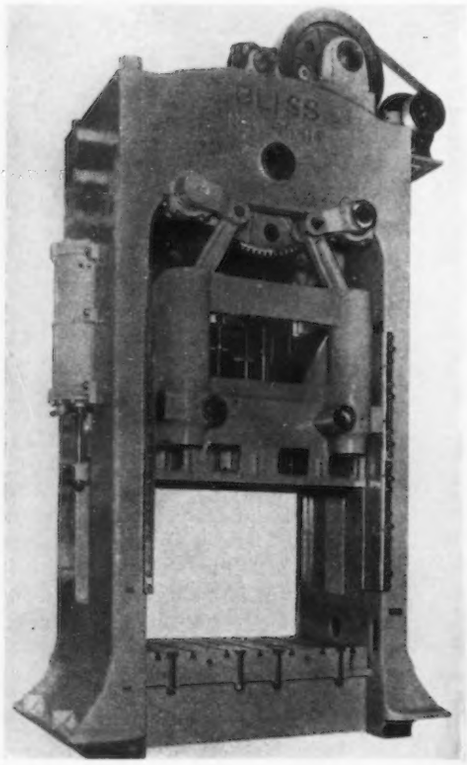
FRAME of this 300-ton all-steel, full eccentric press, made by the Verson Allsteel Press Co., 93rd Street and S. Kenwood Avenue, Chicago, is of all welded steel construction, and all moving parts except the flywheel and clutch are contained within the crown. Clutch is air actuated, with disk type friction brake combined. Though the ram adjusting motor is contained within the ram plates, it is readily accessible. Press as shown measures 60 in. between housings and is available with the solid frame in capacities ranging from 100 to 500 tons in both single and double-suspension types. Tie-rod machines in one, two and four-point suspension may also be had.





dwell at bottom stroke is obtained, desirable for drawing work. The slide counterbalance cylinders are mounted in the uprights, thereby keeping the clean-cut lines of the frame.

The clutch is of the multiple disk, pneumatic type and drive is by V-belts. Control is by push buttons and speed is normally 15 strokes per min. Stroke is 16 in., with 20 in. adjustment so as to permit the use of high or low dies. The bed contains a Marquette pneumatic cushion for

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ABOVE

A MARQUETTE pneumatic cushion in the bed makes this Bliss 84-in. single-action press suitable for shallow forming work, as well as blanking. It was built specifically for the automotive trade.

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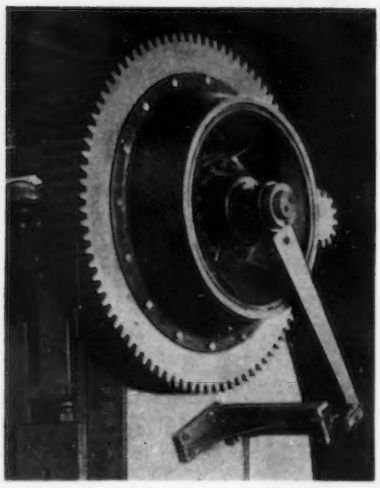
BELOW

THE Servo-Action punch press clutch, made by the Industrial Clutch Co., Waukesha, Wis., is said to hold over 250,000 in.-lb. torque with no greater spring or treadle pressure than required by a jaw clutch. It unites the shockless, instant engagement and durability of the friction clutch with the positive, simple action of the jaw or pin clutch, according to the maker. The clutch is said to engage instantly at any point of the cone when the treadle is pressed. The clutch is built to suit specific applications.



performing drawing operations on a fundamentally single-action press.

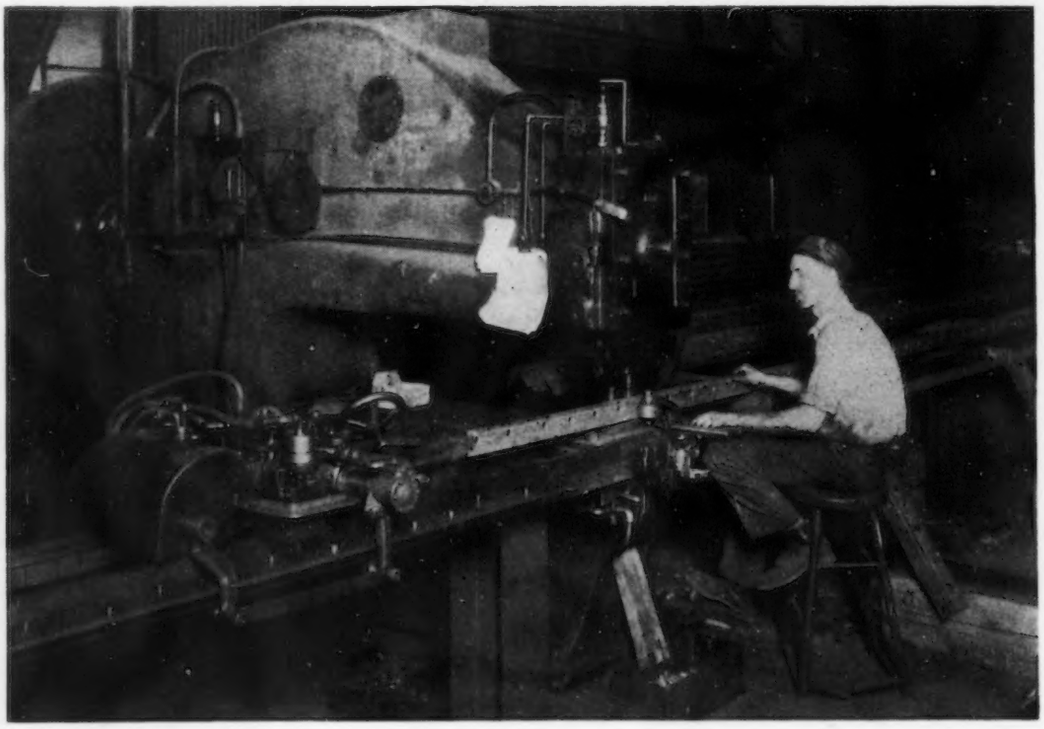
Punching Spacer

AN automatic spacer for punching structural shapes without the use of conventional wood templates has been developed by *A. R. Pollasky*, 3918 North 23rd Street, Milwaukee. The device consists of a spacing table carrying two fixed templates which have a number of holes graduated for 1/16-in. spacing on the work, and an automatic carriage which grips the work and carries it through the punch. When angle iron is being punched, one template is used for the holes in one leg, the other for the second leg. Templates are set by placing a stop pin wherever a hole is desired. The carriage is stopped by the pin and simultaneously is locked to the table. Upon completion of the punching stroke, the carriage automatically moves to the next stop.

When holes in one leg are completed, the gripping jaw swivels and simultaneously the structural member is moved sidewise to the proper gage line through the action of opposed air cylinders. The carriage is driven by a small air motor and the template stops on the carriage are operated by compressed air through a valve coordinated with the punch ram. Carriage travel is about 60 ft. per min. The machine handles angles up to 6 x 6 in., channels to 15 in. and plates up to 18 in. wide.

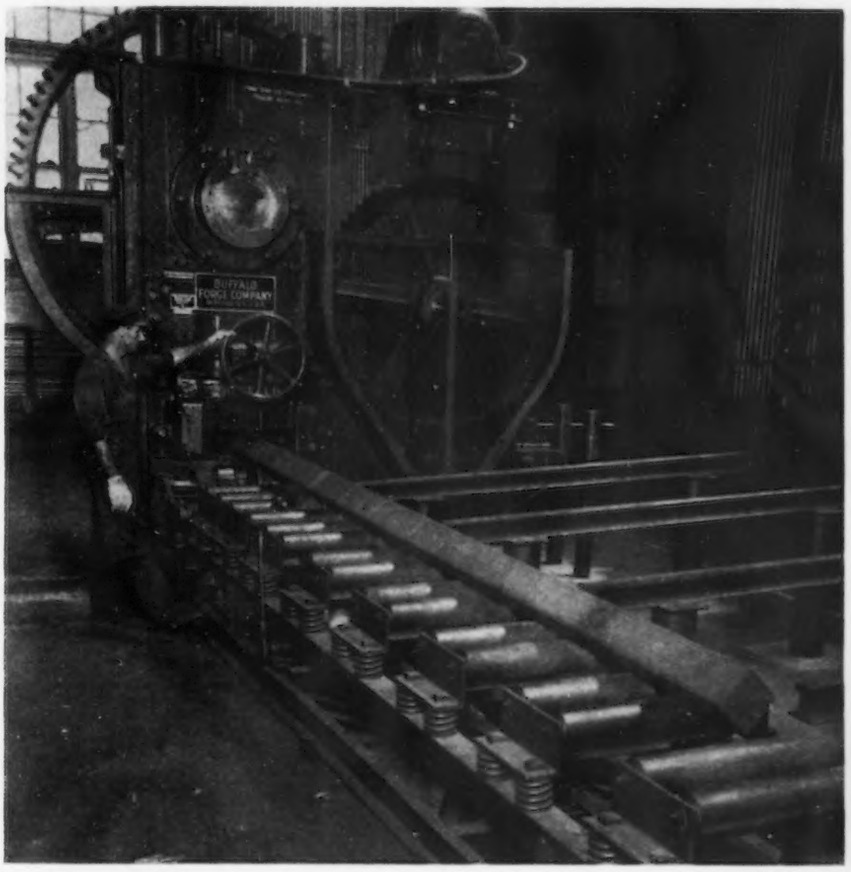
AT RIGHT

RAPID punching of structural shapes on both forward and return travel of the automatic spacing carriage is possible with the Pollasky automatic spacer.



Hydraulic Press Developments

METALWOOD MFG. CO., Detroit, has recently redesigned along modern lines a line of short-stroke, high-speed hydraulic presses for assembly work or for broaching. The unit is clean cut in appearance and is completely self-contained, with the pressure cylinder below the table.



Motor pump and oil tank are attached to the rear of the base plate and counterbalance the weight of the main parts of the press. By using a two-column, double-bolster construction, in place of a former C-frame, the weight of the 6-ton capacity machine has been reduced from 2500 to 1400 lb. The press action is vise-like and loads are canceled within the mechanism in short, straight lines.

This press, with 8-in. stroke, has a working speed of 175 in. per min., with a return speed of 400 in. There is 24 in. clearance between the columns.

A NEW 1000-ton hydraulic metal forming press of the four-column type has just been completed by the *Watson-Stillman Co.*, Roselle, N. J. It is designed to operate with an advance speed of 440 in. per min., pressing speed of 20 in. and a return speed of 600 in. per min. Two levers are provided for manual control. Press and pump make a complete operating unit, including all valves, pipe, gages, oil and air filters and an air cooler.

Press is of steel construction throughout, with the exception of the main ram. Tension rods are of forged steel, and split bronze bearings are used to guide the platen travel on the rods. Main ram is 29 in. in diameter, stroke 28 in. Platen surface is 42 x 42 in. and the vertical opening is 61 in.

A HIGH speed, semi-automatic hydraulic press made by *Hannifin Mfg. Co.*, Chicago, is a compact, self-contained unit said to be adaptable to a variety of operations. The press illustrated has a capacity of 12½ tons, and the complete operating cycle is approximately 2 sec. Hy-Power hydraulic operation provides an automatically completed press cycle when the push button is pressed. This cycle includes: Rapid advance stroke until the die touches the work; high pressure working stroke; reversal at maximum pressure, or rapid return to starting position under no load. The oil pump idles at zero pressure between cycles.

The Hy-Power hydraulic pressure generator is driven by a 2-hp. motor in the 12½-ton press, and is located in the base. The pressure generator unit is mounted on casters and may be removed by disconnecting two pipes. Only electrical connections are re-

AT LEFT

HEAVY duty ball bearing rollers, mounted on springs, are the features of this Mathews bar shear conveyor, capable of handling rounds up to 4½ in. diameter and squares up to 5½ in., in lengths weighing up to 2000 lb. Raising of the entire table is accomplished by means of screw jacks coordinated by a through shaft and bevel gears, which are housed in the supporting structure. Feed of the stock to the Buffalo shear is by a power driven grooved wheel, mounted on a screw providing horizontal adjustment across the face of the shear. A guide roller is placed immediately behind the grooved wheel at a 45-deg. angle.

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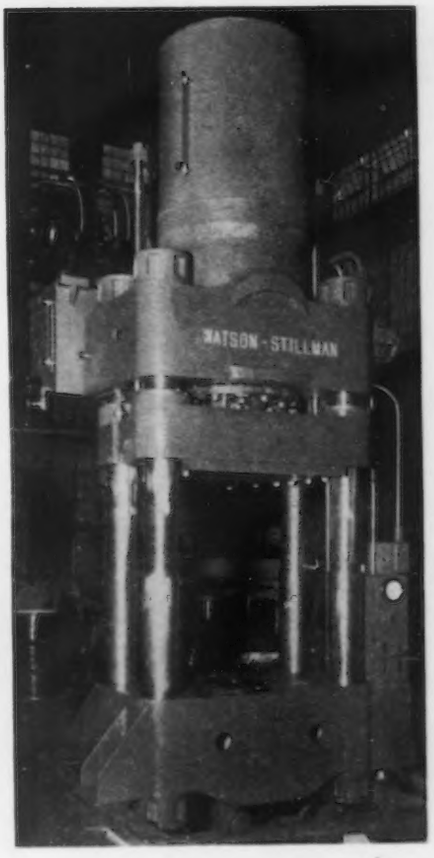
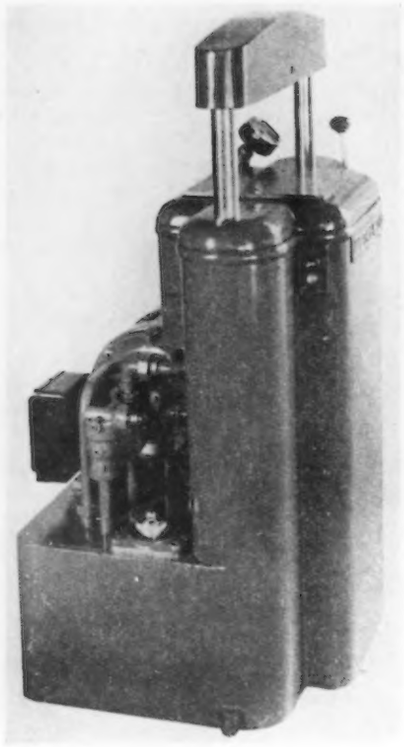
BELOW

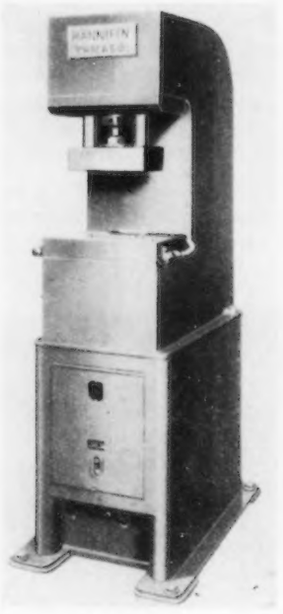
RAPID advance and rapid return of the ram are featured on this recently built Watson-Stillman 1000-ton hydraulic press for forming metal.





ABOVE

BY redesign from an open C-type to this compact vise-like, streamlined construction, 1100 lb. in weight was saved in this improved Metalwood hydraulic assembly press, with capacity of 6 tons.



ABOVE

HY-POWER hydraulic operation provides a complete operating cycle in 2 sec. in this Hannifin semi-automatic, general-purpose press.

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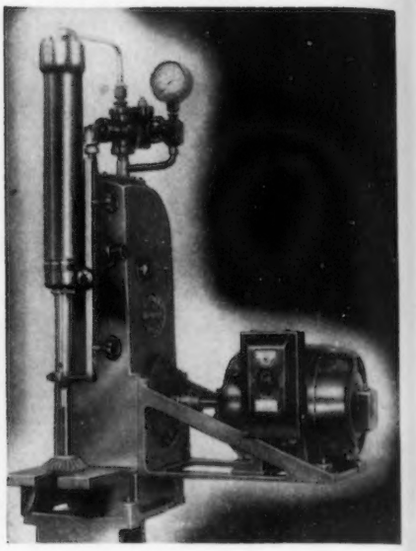

ABOVE

A MACHINED working table with a 2-in. slot is provided in this 1½-ton bench type Greenerd hydraulic arbor press for general production work.

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quired for installation of the press, which is equipped with adequate safety devices.

A COMPLETELY self-contained 1½-ton bench arbor press for pressing, broaching, assembling and burnishing has recently been developed by *Greenerd Arbor Press Co.*, Nashua, N. H. Frame is cast as one unit and the pump and control valve are mounted in the oil sump, which is part of the main housing. Pump shaft is directly coupled to the motor. The

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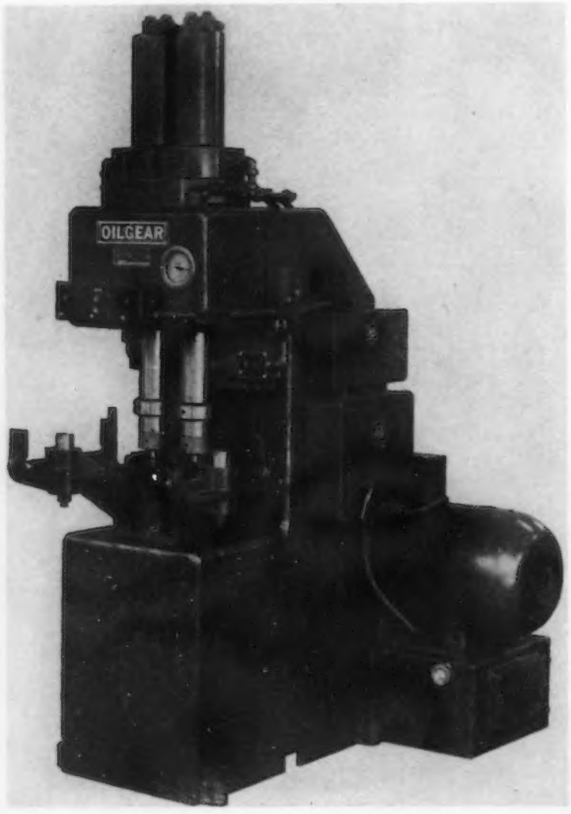

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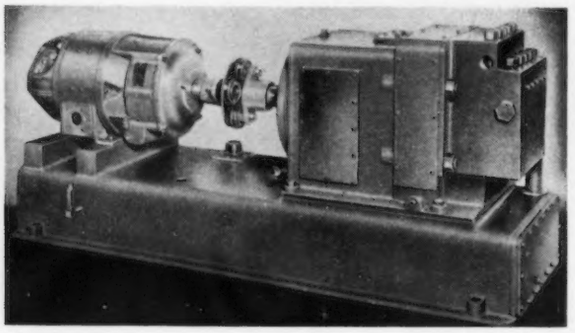
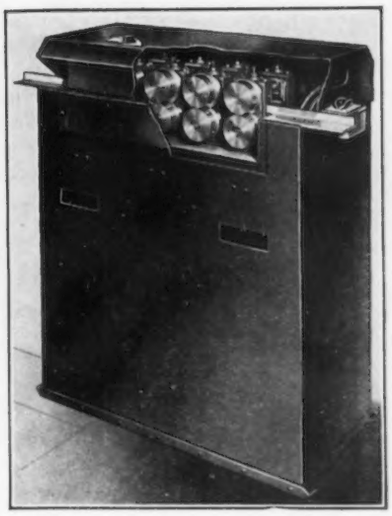
TWO 20-ton vertical cylinders connected in parallel upset two ⅜-in. rivets cold to complete the assembly of right and left-hand front spring seats and steering knuckle support arms in this special Oilgear 40-ton riveting press. Depressing the two push button controls brings the two rams downward simultaneously, and automatically, when a preset pressure sufficient to form the rivet heads is reached, the two rams return to the starting position and stop. The center distance of the two cylinders can be increased, if necessary.

BELOW

WATSON-STILLMAN Uniflo high pressure hydraulic pump units combine the swash-plate form of operating mechanism with conventional packed plunger and poppet valve features in multiple to get a uniform discharge rate.





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BINKLEY Kor-Ner-Lok sheet metal forming machines come in three sizes, suitable for making the so-called Pittsburgh lock.

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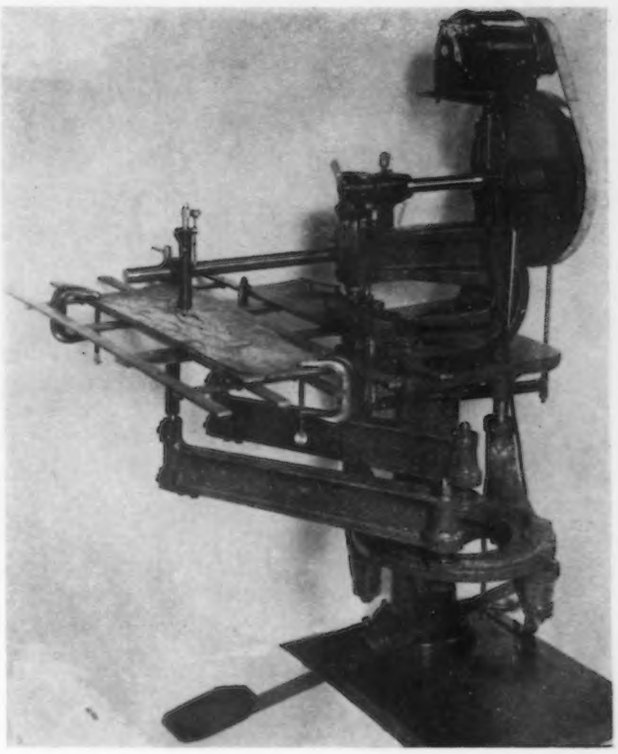


AT RIGHT

WORK and pattern template are mounted on a universally mounted platen in the redesigned Asquith sheet cutting and piercing machine of the nibbling type, which is now available in 12 and 18-in. throats and 3/16-in. capacity.

ram is put into motion by a hand lever and pressure will remain on the work until the latter is released, upon which the ram will return to a power stop. There are six different models available, depending upon the speed desired, which may vary from 140 to 275 in. per min. on the down stroke. A 2-in. piston is used in all models, however, with a 1½-in. ram.

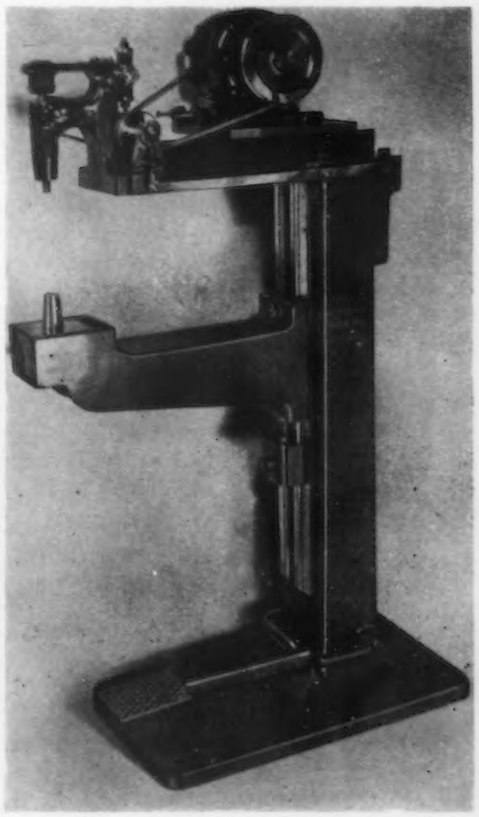
Hydraulic Pressure Pump

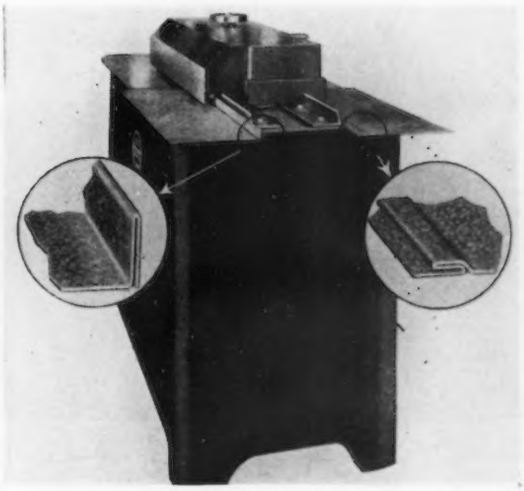
UNIFLO pumps, another new product of the *Watson-Stillman Co.*, represents a combination of the swash-plate form of mechanism with conventional packed plunger and poppet valve features. The hydraulic end of the unit is a single-piece steel forging drilled for plungers and valves. Pumps up to 7½ hp. are designed with five plungers, disposed in a circle, and larger sizes with seven, giving a uniform discharge curve. Piping may be attached to either side, and the position of valves and bonnets makes them readily accessible without disturbing the piping. The electric power unit is entirely separate from the hydraulic end and is fully inclosed.

These Uniflo pumps are available in standard sizes from 2 to 100 hp. for pressures from 1500 lb. per sq. in. and upward. They will handle either oil or water. Sizes up to 25 hp. can be furnished with a variable-speed trans-

AT RIGHT

THE standard gap of riveting hammers made by the High Speed Hammer Co., 313 Norton Street, Rochester, N. Y., is 3 in., but here is an example of a modification of design in a wider gap type. This one has a gap of 18 in., but wider gaps can be furnished. This machine sets ⅛-in. mild steel rivets cold. All movable parts of these hammers are interchangeable with the standard hammers of the same size.





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AT LEFT

THE Almar universal lock forming machine makes Pittsburgh locks in sheet metal joints on one side and standing seam, single edging and drive cleats on the other.

mission for giving a variable pump output.

Magnetized Drain Plugs

MAGNETIZED drain plugs designed to afford protective service for hydraulic machinery or any equipment which uses oil lubricant have been applied in recent months to a variety of types of machinery. These plugs are manufactured by the *List Corp.*, Clarinda, Iowa, and it is said that they will hold their magnetized charge for a period of 10 years or more. They require no screen for filter and are similar to ordinary drain plugs with the exception of magnetized steel inserts on the face of the plugs which catch and hold cuttings or chips which otherwise would circulate with the lubricant. A variety of sizes and types are manufactured.

Sheet Metal Machinery

A NEW model cutting and piercing machine, made in 12 and 18 in. throat, has been brought out by *S. A. Asquith & Son*, 2514 Sunset Boulevard, Los Angeles. As in the example of the company's 12-in. machine with box shape base, the punch cutting the work and the stylus bearing against the pattern are fixed in relation to each other while the pattern and the material being cut are carried on a platen floating in a horizontal plane. This platen is supported on four ball bearing links in such a way that duplication of the pattern can be made within small limits if the diameter of the stylus is the same as that of the punch.

The 12-in. machine has a working area of 12 x 48 in. and the 18-in. one, 18 x 48 in. By turning the sheet over, 24 and 36 in. sheets may be pierced respectively. Any length can be pierced by moving the sheet along transversely. Punches and dies from 0.025 to 0.187 in. diameter are available. Driving motor is ⅓ hp. instead of ¼ hp. used before.

TO reduce costs and save time in making Pittsburgh or corner locks—for rectangular sheet metal pipes and fittings and similar jobs—for furnaces, ovens, stokers, casings, and other such products, the *Binkley Machinery Co.* of Warrenton, Mo., has produced a modernized line of Kor-Ner-Lok forming machines in three sizes, Nos. 22, 20, and 18.

The smallest, the No. 22, forms up five 8-ft. sheets in 2 min., one man doing the job in a single operation. Pittsburgh or corner locks can be produced at the rate of 30 ft. per min. The larger No. 20 machine handles 20-gage and lighter material, making a ⅜-in. seam; and the heaviest, No. 18 machine, handles 18-gage and lighter material, making a ½-in seam.

ANOTHER multiple-roll type machine that is adaptable for Pittsburgh lock forming and related sheet metal fabricating is the new Almar universal lock forming machine, made by *Ward Machinery Co.*, 564 W. Washington Boulevard, Chicago. Capacity is 18 gage and lighter, and the machine is regularly furnished with Pittsburgh lock rolls with a ⅜-in. depth of recess. On the other side of the machine are seven sets of spindles for other types of sheet metal forming rolls, such as single edging, standing seam and drive cleats. They are mounted inside of the frame so that the frame acts as a guide for the material passing through. Speed is 35 to 40 ft. per min. A large calibrated handwheel is used to adjust the machine for different gages. Drive is by a 2-hp. motor with reversing switch.

Lind to Direct Foreign Trade Machinery Meeting

TO serve industry to better advantage in its foreign trade problems, the National Foreign Trade Council, Inc., is preparing to conduct a number of group discussion meetings at the annual National Foreign Trade Convention to be held at Hotel Commodore in New York, Oct. 31, Nov. 1 and 2. One of these group meetings will be devoted to the foreign trade interests of the machinery industry.

Lewis M. Lind, chief of the machinery division of the Bureau of Foreign and Domestic Commerce, will help conduct the discussions.

Allegheny Employees Pay Tribute To H. E. Sheldon

THIRTY-ONE long-time employees of the Allegheny Steel Co. paid tribute to the late Harry E. Sheldon—father of the stainless steel industry—and former president of the Allegheny Steel Co., when they formally dedicated a memorial tablet on the grounds of the company's plant in Brackenridge, Pa. Made of solid cast bronze in bas relief, the memorial tablet was mounted on a solid hand hammered Allegheny Metal ingot, weighing more than 7825 lb. The tablet was purchased by the employees through subscription among themselves.

GENERAL view of one of the world's largest airplane factories, that of the Curtiss Aeroplane Division of Curtiss-Wright Corp., in which a large number of Niagara presses and shears are shown.

A Look Ahead in the Abrasive Industry

HOWARD W. DUNBAR

o o o

By HOWARD W. DUNBAR

Vice-President, The Norton Co.
President, National Machine Tool Builders' Association

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WHEN one attempts to project the problems of today and predict what the future may be, it is unquestionably helpful to reflect on the performance of the past. In the early days of the abrasive industry grinding as a production operation was not practiced in the average machine shop. Not until the production grinding machine was developed in 1900, did it take on the aspects of a major machining operation. I am amused in looking back over some of the records of our abrasive industrial history to see how simple the problems of those days were, and following them through the years to observe how they took on, both in practice and theory, the broader aspects of our present-day knowledge in grinding.

Even in 1910 I read in a lecture delivered before the Technology Club in Syracuse, where it is reported that it was evident from the number of questions asked by the audience on this and other similar occasions, that the interest in grinding was growing, and engineers were eager to learn of the experiences of others. One example was cited of a large spindle on which a guarantee of production had been given of one and one-half pieces per hr., to a limit of 0.001 in. The report from the customer ran as follows: "The Norton Grinding Company's demonstrators will have to continue to keep in fine physical condition in order to be able to set a good pace, as we have in our factory a young man who can finish grind this same shaft in 30 min. We can even convince those who have never been outside of Missouri."

One can only be impressed with the fact that even in those days they were groping for enlightenment in grinding practice, and their problems were so simple that today we have practically forgotten the troubles then and there encountered.

As we follow through the history of grinding, in 1927 I read an article from which I quote as follows: "The grinding wheel still remains in obscurity—in the mind of the layman a product used to sharpen a knife or brighten a bit of brass, few realizing that the security of our industrial life rests in the ability of the grinding wheel to shape and fashion hardened steel parts to a degree of perfection difficult to perceive."

We spoke of limits, requirements, surface finish in terms which in those days were measured in a thousandth part of an inch. As time went on we began to split the thousandths into tenths. And today we are splitting tenths, as the never-ending struggle in refinement and accuracy goes on.

In the growth of our industry there have been several periods when we stood on the threshold of success, brought about by research and development work in other fields of endeavor: First in 1900 when grinding practice first became a major machining operation; in 1910 when the automobile industry was first experiencing growth and success. At this point grinding was largely responsible for the development of the automobile, since it enabled the manufacturers to fabricate the newer types of alloy steels, and reduce the weight and cost of the car. In 1920, after war years, when general industry started in to grow, expand and broaden through the introduction of newer types of materials, the grinding industry was given a further impetus. During these years lowered costs, higher production overshadowed the real purpose and opportunities offered by grinding practice. I have reference to accuracy, perfection and surface qualities. Today we stand on the threshold of another technical engineering era, and quality and refinement in products of all kinds is uppermost in the minds of engineers. We speak in terms of micro-inches which, being translated into laymen's language, means the millionth part of an inch. And surface quality must be flawless.

How many of us really appreciate

From an address before the Grinding Wheel Manufacturers' Abrasive Grain Association, Osterville, Mass., Sept. 8.

what a millionth part of an inch actually is! Let's see how we can play it up so that the minuteness of such a mechanical dimension can be fully appreciated.

We can all picture in our mind's eye what an inch means. We can all quite accurately, with our fingers, illustrate to one another about how much space between one's fingers represents an inch of measurement. There is no way to describe in the same manner what a millionth part of an inch is. The only way such a dimension can be measured is by extremely sensitive instruments which magnify thousands of times. Now for the sake of imagination, assume that a millionth part of an inch was magnified so that it was the same length as the inch space on your ordinary carpenter's rule. If this was the case then how long would an inch be if magnified in the same way? Well sir, it would be almost 16 miles long.

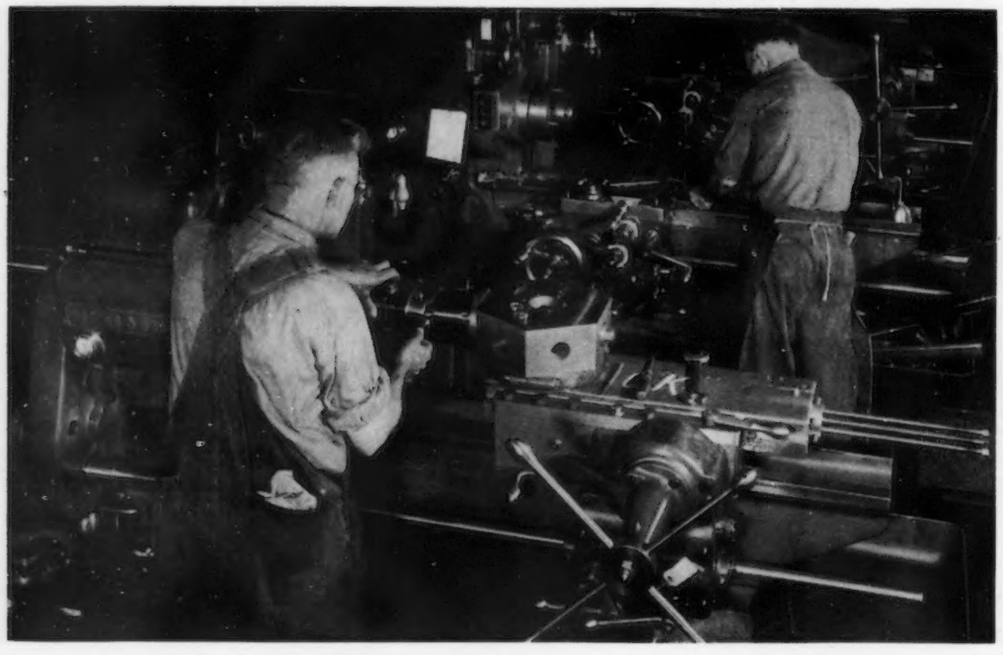
Research and development must lead to the successful answer in this demand for greater accuracy. As I view the picture, only by the abrasive processes such as grinding, lapping and honing can these fine results be accomplished. It calls for better machinery, better wheels, better abrasives and variations in the bonding of abrasive materials, which is seeking for more uniformity in both products and performance. Our opportunity lies ahead of us. How well can we satisfy it?

"We shall see many things we have dreamed of and of which no man has yet dreamed. We need dreamers to pull us out of the rut, and hard-headed business men to pull the dreamers back to earth. We need the old-style Yankee mechanics; we need economists; we need men who can sell, to stir up latent desires for the things some men can build and others can use. In fact we need about everybody who can do something worth while."

Brains, ingenuity, adaptability have always been factors in any successful enterprise. Just as long as we persevere in this industry, keep our wits sharp in aggressive trade and reach out for more knowledge through research, we can look forward to a greater future. Yankee ingenuity is simply synonymous with being able to find ways and means to do many things extremely well, and to a fine standard of quality, and then keep on performing to this never-ending requirement. Our future success will again come from exercising our skill and energy, the foundation upon which we have always built those contributions to industry in products, men and ideas. We must be alert to the improvements in arts, sciences, materials and methods. We must always be forward-looking and forward-thinking, facing the opportunities of the future where we may eventually realize "the land of promise fulfilled." If we spend too much time glorying in yesterday's successes, or brooding over yesterday's failures, there will be no time for the fulfillment of the successes of tomorrow.

In conclusion may I ask this question? "What makes progress possible? One of the characteristic ingratitudes of humanity seems to be particularly prominent in our generation. It is the tendency to assume that our material blessings are the gifts of Nature, conferred upon us without human effort. Such an attitude ignores the debt we owe to the long years of creative endeavors, of strivings and sacrifices by those who pioneered and developed these things which we take for granted. . . .

"What was it that made those enormous strides possible? Did they just happen? They did not. . . . It was the work of man. It was the spur to these hundreds of thousands of men and women, to take their losses and their risks in a system of free enterprise—which offers the chance to earn a profit, to acclaim praise for success, yes, but to be materially rewarded for success too. Freedom and reward—the reward of a material kind and the reward of applause and honor for a job well done. That is American enterprise."



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THE 50,000th turret lathe produced by Warner & Swasey Co., Cleveland, is here shown during assembly late last week, in preparation for a celebration Wednesday, Sept. 28, at Cleveland, attended by metal working and machine tool executives, and industrial magazine and newspaper officials. Photo shows a machinist checking the alinement of the spindle with the bed. The turret lathe will be shipped to Pratt & Whitney Co., Hartford, Conn., the company which employed Worcester Warner and Ambrose Swasey between 1870 and 1880, before they came to the Middle West to found their own concern. Participating in the elaborate program celebration were 40 to 50 veteran Warner & Swasey employes.

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ABOVE

PRECISION machining was required to form air-tight joints between the six segments of the Westinghouse Cupaloy Time Capsule. George Rennie, a Westinghouse tool maker, is shown measuring the inside bore of an end piece preliminary to chasing the thread.

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AT RIGHT

J. B. SEASTONE, left, and W. A. Graham, Westinghouse engineers, inspect the seven and a half-foot Cupaloy Time Capsule and its six-foot inner shell of heat-resistant glass, just before they were packed for shipment to New York where they will be buried for the next 5000 years.

"To Be Dug Up in 6939 A. D."

WHAT will civilization, if any, be like 5000 years from now? That is a question that we cannot answer. But the people of 6939 A.D., if any, will be able to find out what civilization was like in 1938.

This is assured by a ceremony which took place on Friday, Sept. 23, when the "Time Capsule" was buried beneath the World's Fair exhibit building of the Westinghouse Electric & Manufacturing Co.

The capsule, made of Cupaloy, which is a heat-treatable alloy composed of copper, chromium and silver, is 7 ft. 6 in. long and 8 in. in diameter, with 1 in. walls. Inside of the metal capsule has been sealed a glass lining from which air is evacuated and replaced by inert gas. Within this receptacle has been placed a cross-section of examples of our modern life and art as represented by newsreels and books in microfilm, selected metals, alloys, products, etc.

Three hundred copies of instructions to the citizens of America 5000 years hence will be distributed to museums, libraries and other institutions which may be expected to endure so that the people of 6939 A.D. may know just where and how to dig up the mementoes of 1938 civilization—(if you may call it that).

THIS WEEK ON THE ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

. . . Auto output swings upward . . . Ford sales manager foresees sales backlog of 2,000,000 cars by end of next year . . . Cylinder bore liners to be used in Ford engines . . . Packard president scores selling on price alone . . . Hupmobile shows low priced Six with rakish lines.

DETROIT.—Barring the unforeseen, automobile production will follow an upward path the next month and a half toward the peak which it is expected to attain in November. Increased activity during the last week was observed in several plants, resulting in increased output and sharp employment gains. With 10 producers now assembling 1939 models, the output of the industry last week reached 20,390 units, compared with 16,100 the week before and 28,030 a year ago, according to Ward's Automotive Reports. Signs of renewed activity at plants of two of the biggest producers, Ford and Chevrolet, indicate that sharp increases in assemblies can be looked for in a very few weeks. Chevrolet still is closed for model changeover, while Ford is virtually closed, having assembled only 1600 units in the past week, and those for export.

The position in which the industry finds itself, so far as stocks are concerned, is illustrated by registration records for the first 15 days of September from the leading cities of the United States. For the first half of the month registrations are down 31.7 per cent compared with August, according to R. L. Polk & Co. The downward movement is attributed to the fact that new and used car stocks are more completely exhausted than at any time in years. There is little possibility of a sharp pick-up in sales and registrations until enough 1939 cars are in dealers' hands to permit ready delivery to customers. Packard, Buick and Plymouth have a supply of cars in dealers' hands but the quantity is not large enough to make any showing in sales.

Ford Predicts Sales Gain

A Ford spokesman has gone on record predicting a 25 per cent gain in sales of 1939 models. This makes the opinion unanimous, with Chrysler and General Motors officials having already used the same figure. Speaking at Colorado Springs, Colo., to Ford service and accessory managers, J. R. Davis, Ford general sales manager, added that there would be a sales backlog of around 2,000,000 units at the end of 1939. He pointed out that for the last five years the industry has built an average of 3,700,000 cars a year. On the basis of 2,250,000 units in 1938, this indicates a backlog of around 1,500,000 cars and trucks, he said. And with 3,000,000 assemblies likely in 1939—700,000 units short of the five-year average—a total backlog of 2,000,000 units will be built up over the two years, he predicted. Whether such cumulative reasoning is justified might be debated, and it will take a year or two to check up on the facts.

For several weeks there has been a rumor that Ford will use replaceable liners in the cylinder barrels of 1939 engines. The practice is so uncommon in the passenger car field that many people did not place much credence in it. But the story has been verified. In the past few weeks liners have been put in many engines produced at the Rouge, particularly those intended for truck use. As fast as equipment can be provided for manufacturing the liners, they will be generally adopted in the 1939 engines, it is understood. For trucks there is a particular advantage in that much more rapid overhauls can be made by removing the liners and installing new ones rather than re-boring and attempting to rehone the old barrels, then fit new pistons.

New Cars Previewed

Many new cars were previewed during the past week, with Packard providing one of the most interesting shows in the industry. More than 3000 distributers and dealers of the Packard company and approximately 100 newspaper men from all parts of the nation were transported in 100 buses to the Packard proving ground, where the new models were put through a series of vigorous tests. Demonstrations of safety, speed, frame rigidity and ease in handling were made. Of particular interest to those in the industry were a series of races in which Packard engineering executives drove at speeds approaching 100 miles an hour around the proving ground track. Charles Vincent, proving ground head, drove a fast five-mile race with a new Packard to beat Clyde R. Paton, chief engineer, and Col. J. G. Vincent, vice-president in charge of engineering. Paton also won a 10-mile race in which the two Vincents and J. A. Jacks, chief test engineer, were pilots.

Chief new feature of the new Packard is the "Econo-Drive," an over-drive unit available on the Super-Eight, 120 and Packard Six. In conjunction with the over-drive is a "kick-down unit" which provides instantaneous return to third gear performance, giving "super-acceleration"

Representative Data on the Corrosion Resistance of Ni-Resist Compared With Unalloyed Cast Iron

HERE is new data on corrosion rates of plain and Nickel alloy cast irons subjected to solvents and reagents commonly used by industry. Compiled in convenient form, this information was collected from many sources during several years' research.

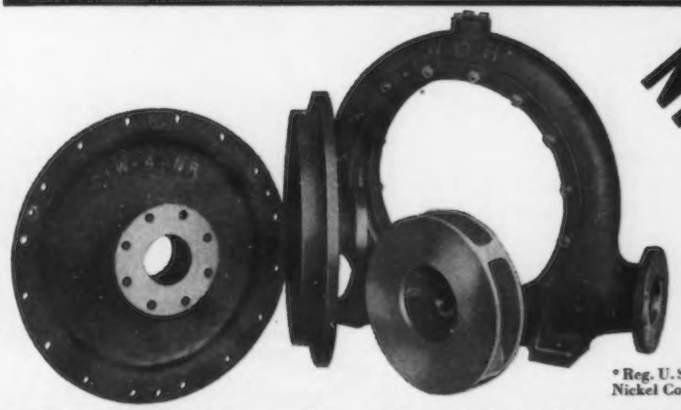
Original figures have been compiled into ratios for quick comparison. In these ratios the figure 1 represents the penetration rate on Ni-Resist* compared with higher figures representing correspondingly faster penetration rates on plain cast iron.

You may want to remove this corrosion rate table and file it for reference. Or additional copies can be obtained upon request. Your consultation regarding applications of Ni-Resist, a versatile corrosion-resisting Nickel cast iron, is invited.

Corrosive	*Conditions*	*Corrosion Loss Ratio Ni-Resist to Unalloyed Cast Iron*
33% Acetic Acid	Quiet Soln. at 20° C.	1 – 50
5% Citric Acid	Quiet Soln. at 20° C.	1 – 165
1% Hydrochloric Acid	Quiet Soln. at 20° C.	1 – 31
5% Hydrochloric Acid	Quiet Soln. at 20° C.	1 – 65
5% Hydrochloric Acid	Aerated, room temp.	1 – 54
10% Hydrochloric Acid	Aerated, room temp.	1 – 51
20% Hydrochloric Acid	Quiet Soln. at 20° C.	1 – 186
20% Hydrochloric Acid	Aerated, room temp.	1 – 31
1% Nitric Acid	Quiet Soln. at 20° C.	1 – 1.1
5% Nitric Acid	Quiet Soln. at 20° C.	1 – 1.2
20% Nitric Acid	Quiet Soln. at 20° C.	1 – 1.3
1% Sulfuric Acid	Quiet Soln. at 20° C.	1 – 64
5% Sulfuric Acid	Quiet Soln. at 20° C.	1 – 190
5% Sulfuric Acid	Aerated, room temp.	1 – 44
20% Sulfuric Acid	Quiet Soln. at 20° C.	1 – 338
5% Tartaric Acid	Quiet Soln. at 20° C	1 – 100
5% Ammonium Chloride	Quiet Soln. at 20° C.	1 – 3.5
5% Ferric Chloride	Quiet Soln. at 20° C.	1 – 1.6
10% Magnesium Chloride	Quiet Soln. at 20° C.	1 – 2.5
Sea Water	Quiet Soln. at 20° C.	1 – 4
3% Sodium Chloride	Quiet Soln. at 20° C.	1 – 1.6
3% Sodium Chloride	Aerated, room temp.	1 – 4
Caustic Soda, hot	In an evaporator conc. to 100-130° Tw.	1 – 24
CO_2 Saturated Hot Tap Water	Corresponding to bad boiler water	1 – 6.6
In a Fatty Acid Still	In liquid at 400-500° F.	1 – 52
In an Oil Sulfonator	Sulfonation of Neats Foot Oil	1 – 102
Paper Mill Sewer Water	As discharged to the main sewer	1 – 30
Sugar Liquors	In a glucose evaporator	1 – 2.5

5 Times Longer Service

In a Tennessee fertilizer plant, handling gypsum sludge containing low percentages of sulphuric and phosphoric acids and a trace of hydrofluoric, this 4" pump operated 5 times longer than identical castings of plain iron. This pump was made from Ni-Resist, a Nickel cast iron by the Georgia Iron Works, Augusta, Ga. Dense, uniform grained Nickel cast irons offer increased resistance to wear and abrasion — in addition to greatly retarding corrosion.



NI-RESIST*

* Reg. U. S. Pat. Off. by The International Nickel Co.—Canadian Patent No. 278,180

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

when it is needed. A mechanical type gear shift mounted under the steering wheel will be used on the three lighter cars, while the big Twelve will have a power-actuated shift.

Alvan Macauley, president of the company, in an address, acknowledged that Packard is working on a small car. It will be a year, however, before anything comes of it, he said. Macauley said that a survey of general business conditions indicated greater confidence than in many months. He predicted a successful year for the company. Speaking to the sales group, he scored automobile salesmen who stress price and trade-in values rather than quality, and asserted that trying to sell on price alone was "a wicked practice." He advocated cooperative effort through trade associations to restrict this practice.

The company will produce the same four lines as were manufactured last year, including the Packard Twelve, Super Eight, 120 and Six. Prices displayed on the Packard cars indicate that there will be some minor upward adjustments, as well as some important reductions. The price of the Packard super eight has been reduced approximately $700, bringing it into the $1,900 to $2,300 class, the reduction being approximately 25 per cent. On the other hand the Packard six has been boosted about 25 per cent on all body types and Packard 120 and eight have been reduced about 25 per cent. The 12-cylinder cars are unchanged in price.

Buick Speeds Output

On the day of Buick's press preview, thousands of men were recalled to work and the assembly lines went on a two-shift basis to meet the increased production schedule for the next two months. Assemblies had been running more than 700 cars daily, with the highest day's output reaching more than 812 cars on a single shift. According to Harlow H. Curtice, Buick president, it is expected that the daily output will average 1100 cars on the two-shift basis.

One of the minor Buick features which will attract a lot of attention is an emblem in the middle of the trunk door in the rear of the car which is a cleverly designed flashing light signal to indicate turns. It is operated from a switch mounted on the mechanical gear shift lever, directly under the steering wheel. This safety device is indicative of a point being much stressed in 1939 cars—safety on the highway. That is the reason for the greater visibility being featured in almost every new car, and the improved brakes, better control and emphasis on acceleration. The need for reserve power is illustrated by a Buick executive who declared that tests show that 20 per cent of drivers, passing other cars on highways, pass within one second of a head-on collision. The 1939 models are emphasizing the advantage of reserve engine power and speed to avoid danger on such occasions.

It is interesting to know that Buick has redesigned chassis frames, cutting them short at the rear; overhang beyond the rear axle is no longer necessary to carry leaf spring ends, since the change to coil suspension.

Hupmobile, which showed its new cars to a limited group late last week, has announced that production of 1939 models is underway. Initial operations, according to Norman de-Vaux, general manager in charge of operations, involved increased employment in the stamping plant and machine shop. S. L. Davis, president, announced that an underwriting group has advanced a sufficient amount of cash, pending completion of permanent financing, to permit the start of production. Orders have been released to suppliers for the first production run on the 122-in. Six and the 125-in. Eight and a new low priced Six which will be on a 115-in. wheelbase.

The low-priced Six is powered with the same 101-hp. engine that is used in the Senior Six. The chassis is of the conventional rear axle drive, although the body dies are those recently purchased by Hupp from Cord, which was a front axle drive. The bodies, very similar to the Cord bodies, have been dressed up and observers agree, made better looking. The same bodies will later be available on a chassis powered with a four-cylinder engine. The new Six weighs only 2900 lb. and with its 101 hp. engine should provide outstanding performance.

River Freight Shipments Show Sharp Increase

THE Federal Barge Lines carried 257,300 tons of freight on the Mississippi River system, exclusive of the Ohio, in August, compared with 180,857 tons in August, 1937. For the first eight months of 1938, the total tonnage was 1,812,936 compared with 1,294,573 in the corresponding period in 1937.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

REDRAWN BY REQUEST
THAT LUMMOX SEZ — "NO BOY O' MINE IS GONNA WORK IN NO SHOP, IF I KIN HELP IT" — AN' LOOKUT 'IM MAKIN' HIS KID COME T'MEET HIM EVERY DAY AN' CARRY HOME HIS LUNCH BOX AN' OVERALLS. WHY, THAT BOY IS BEIN' TRAINED RIGHT FOR TH' SHOPS! "AS A TWIG IS BENT SO SHALL IT GROW"!
OH, THAT'S TH' BUNK! HE'S CURIN' HIM YOUNG — BY TH' TIME THAT KID'S OLD ENOUGH T'GO T'WORK HE'LL BE SO FED UP ON PADDLIN' BACK AN' FORTH TO A SHOP, THAT YOU WON'T BE ABLE TO GIT HIM NEAR ONE --- HE'S WORKIN' IT RIGHT!
9-23
J.R.WILLIAMS
COPR. 1938 BY NEA SERVICE, INC.
THE CURE
T. M. REG. U. S. PAT. OFF.

Stanley A. Knisely New Head Of Industrial Advertisers

CLEVELAND. — Election of Stanley A. Knisely, advertising manager Republic Steel Corp., Cleveland, to the presidency of the National Industrial Advertisers' Association, Inc., climaxed the sixteenth annual Conference and Exposition of the association in Hotel Statler here Sept. 21 to 23, a convention which from the standpoint of attendance and general interest, overshadowed its predecessors.

Mr. Knisely was chairman of the general conference committee for the convention and a vice-president of the association. In 1927 he was appointed director of research and advertising for the Flat Rolled Steel Association, after many years in the newspaper business, and in 1934 became director of advertising for Republic Steel Corp.

The association's six vice-presidents are: Charles McDonough, Combustion Engineering Co., New York; Theodore Marvin, Hercules Powder Co., Wilmington, Del.; R. P. Dodds, Truscon Steel Co., Youngstown; V. R. Young, Canadian General Electric Co., Ltd., Toronto; and Herbert V. Mercready, Magnus Chemical Co., Garwood, N. J.

Hohman Elected

The newly elected secretary-treasurer is A. E. Hohman, Blaw-Knox Co., Pittsburgh. New York was selected as the site of the next convention.

Annual prizes to business papers in the competition conducted by *Industrial Marketing* were awarded at the convention. Honorable mention in Class 2, for the best single article or editorial pertinent to the advancement and welfare of the field served by the paper, was awarded to THE IRON AGE for an article on stainless steel, by T. W. Lippert in the issue of May 5, 1938. First prize in this class was awarded *Automotive Industries*. Honorable mention was also given *Cotton Trade Journal*.

First places in the other two classes were won by *American Builder and Building Age* and *Creative Footwear*. Honorable mention in Class 1 went to the overseas edition of *American Automobile* and to *Electrical Contracting*. Honorable mentions in Class 3 went to *Packaging Digest* and *Metal Progress*.

Billingsley Speaks

The same techniques of sales promotion, sales training, sales stimulation and user education that have reached high development in the consumer-goods fields are being rapidly adopted in the industrial field, and many agencies today give fully as much study to business paper advertising as they do to general media, pointed out A. L. Billingsley, president Fuller & Smith & Ross, Inc., in an address Sept. 22.

S. D. Mahan, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., advocated a continuous effort to make management and production executives enthusiastic about advertising plans.

"If you want to put your program over, talk about it in terms of jobs to be done, not dollars to be spent," Mr. Mahan said.

Dale Wylie, Iron Fireman Mfg. Co., speaking at the Wednesday afternoon session, likened publication advertising to the artillery barrage supporting the salesman. B. W. Bullock, General Electric Co., urged the adoption of specific and workable sales plans on every line of product.

John A. Murphy, vice-president, G. M. Basford Co., speaking on "Finding the Facts," told how distribution systems have become elaborate and complex in recent years. In altogether too many cases he said the salesman is not properly backed up by advertising, or advertising is not supported by the salesman.

Urges Group Be Supported

Richard P. Dodds, Truscon Steel Co., Youngstown, speaking on "Five Dollars Will Get You Five Thousand," pleaded for vigorous support of the association by each chapter in order that new achivements might be accomplished.

R. Davison, past president of N.I.A.A., and manager of the Market Development Division, New Jersey Zinc Co., discussed the new N.I.A.A. Publisher's Statement form, and benefits of its use.

Frank Wyse, retiring president of the association, Bucyrus-Erie Co., South Milwaukee, Wis., urged the adoption of wider outlooks by advertising men and the expenditure of extra energy and extra thought in the analysis of all phases of his company's activities.

T. M. Girdler, chairman, Republic Steel Corp., urged public good will activities by business and industry, as reported in the Sept. 22 issue of THE IRON AGE.

STANLEY A. KNISELY

35 Attend Central Furnaces Reunion

CLEVELAND.—The annual reunion of former executives of Central furnaces of the American Steel & Wire Co. was held at the Congress Lake Country Club near Canton, Ohio, Friday, Sept. 9. About 35 men attended the reunion. Martin McCune, retired, formerly master mechanic, was the oldest member in attendance. The committee on arrangements consisted of Ed. Riemenschneider, Ed. Yaeckley, John Hopkins and Cliff Wyman. C. A. Orr, formerly superintendent of Central furnaces and now president of the Union Metal Mfg. Co., Canton, was toastmaster. The reunion next year will be held in Cleveland.

THIS WEEK IN WASHINGTON

. . . Armco president tells Management Congress free enterprise lifts American living standard to top . . . Ralph E. Flanders holds long-time security cannot exist without incentive . . . Trade associations receive Monopoly Committee questionnaire.

o o o

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

o o o

WASHINGTON.—The achievements of free enterprise as against excessive Government control constituted an important theme that ran throughout the Seventh International Management Congress whose five-day session came to an end last Friday. Particularly did American and British delegates emphasize the superiority of democracy and private initiative for the well being of society, socially and economically, over Government centralization with its social and economic regimentation, which found minority expressions of approval from German and Italian delegates. The convention was attended by some 2000 delegates.

Sharing prominently in the advocacy of private initiative were Charles R. Hook, president of the National Association of Manufacturers and the American Rolling Mill Co., Middletown, Ohio, and Ralph E. Flanders, president of the Jones & Lamson Machine Co., Springfield, Vt.

Back Democracies' Systems

Mr. Hook, a member of the President's labor commission which recently surveyed labor-employer conditions in Great Britain and France, spoke on "The Continuance of Free Enterprise," while Mr. Flanders spoke on "The Balancing of Incentive and Security." Vision, ability, hard work and thrift were listed by Mr. Hook as the principal factors in the development of free enterprise and qualities which are needed to insure the successful continuance of the incentive system. Mr. Flanders declared that there is no long-time security without incentive and security and pointed out that for a continuance of achievement in Western civilization "we must strike a balance between the two policies."

The crews of Mr. Hook, Mr. Flanders and English delegates contrasted sharply at points with expressions by such delegates as those reflecting the contentions made by Gino Olivette of Rome, chairman of "Enios," the Italian Guild of Scientific Management and Labor. Mr. Olivette advanced the thesis that "protection of the working classes" should be considered Government's "most positive and important province."

Highest Wages Here

Mr. Hook said that if America stands at the head of the nations of the world in the standard of living, it is because of the development of free enterprise. He pointed out that the highest wages in the world are paid American workers, and dwelt upon other outstanding economic and social values enjoyed by the people of the country.

Industrial machinery, he said, has made possible mass production with steadily better products and at lower cost. Most important of all, Mr. Hook declared, steady progress has been made in wiping out poverty. He urged the necessity of bringing a decent standard of living into the homes of the most humble without taking away from the great numbers who already enjoy a high standard of living.

"These wonders have been achieved by no one man," said Mr. Hook. "They have been the result of the work of no one group of men. No Government is responsible for them. No concentration of wealth has brought them about. The motivating force is the free enterprise system, that is commonly called capitalistic system. I like to call it the incentive system. Under it we have encouraged individual initiative and accomplishment through a proper compensation of those who have been willing to work hard and to make the necessary sacrifices. This encouragement of individual initiative and accomplishment through a proper compensation of those who have been willing to work hard and to make the necessary sacrifices. This encouragement of individual initiative is essential to our system, it is, in fact, its very keystone."

Thrift a Passing Word

"Destroy the hope of reward and you stifle initiative," said Mr. Hook, after referring to well-meaning theorists and idealists who, he said, advocate programs which have retarded progress by attempting too drastic limitation on the reward for accomplishment. "Ability becomes relaxed, pleasure is substituted for hard work and thrift is only a passing word. On the other hand, the encouragement of these characteristics, through the operation of the private enterprise system, has resulted in the improvement of produce and products necessary to our everyday life."

Mr. Flanders expressed the belief that the country's physical resources, technical progress and numbers of populations justified preparations for expansions both in standards of living and in industrial activities and contended that business leadership has been lacking in the spirit of enterprise since 1929. Although granting that there were various explanations for this state of affairs, he insisted that the limits of the country's productivity had yet to be reached. As a means towards effective realization of existing possibilities, he advocated a clearer understanding of the need for a balance between security and incentive.

Granting and in some measure advocating society's obligation to youth, the unemployed, the underprivileged and the aged, Mr. Flanders was, nevertheless, critical of the view points of "the social worker whose mind is fixed on security alone," and of "the politician who finds the easy road to

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maintenance of power that of the promise of security."

Incentive Necessary

"Security," he said, "is a much easier thing to provide on a temporary and spectacular basis than is the much more fundamental achievement of a raised standard of living."

Incentive must be provided, he declared, both for "the routine worker whose principal desire is for steady work at good pay," and for the ambitious worker who is "desirous of assuming responsibility and of expanding his responsibility to the limit of his powers."

According to Mr. Flanders, the first group must be enabled to enjoy pride of craftsmanship, while the second must be afforded opportunity to becoming a part of management. In this latter connection, the speaker indicated a belief that the way was clear due to the fact that the responsibilities of management are passing from the hands of inherited wealth into those of a separate management class.

"We may almost say," Mr. Flanders declared, "that the day of the capitalist has passed. Ownership is no longer as a rule vested in powerful individuals. Ownership is continuously more subdivided and fractionated. The opportunities of management are increasingly more and more open to those who can only gain them by other means than by inheritance."

2300 Trade Associations Questioned on Monopolies

WASHINGTON.—The Bureau of Foreign and Domestic Commerce has sent out schedules to approximately 2300 national and interstate trade associations which are to provide part of the information as the basis for a report to the Temporary National Economic (monopoly) Committee. The bureau said that all interested Government agencies cooperated in the drafting of the questions and that valuable suggestions were obtained from a large number of trade association executives.

Divided into six parts, part one of the schedule deals with the management and affiliations of each association. Part two includes questions on the officers and composition of the membership. Part three, concerned with the activities, consists largely of a check list designed to determine the scope of the association's work and the phases of the work receiving particular emphasis. Part four requests information regarding the personnel of the association and outside organizations employed to handle special duties. Part five calls for income and balance sheet data and details concerning dues and assessments. Part six concludes the schedule with a series of questions which, it was stated, will enable each trade association executive to elaborate on such points as the significant contributions of his association to his industry and important contributions which he feels his association can make in the future.

The schedule calls for copies of the constitution and by-laws, publications, annual reports, and a list of members.

Trade association executives are told in the general instructions that this survey is to be limited to national and interstate associations and does not cover state and local ones except as these state and local associations have an interstate or national influence.

Since the schedule has been tried out in a number of instances, members of the Bureau expressed the belief that it will be easy to fill out, and for that reason anticipate an early return. Because of the wide interest among trade association officers in the survey, it was said it is felt they will cooperate 100 per cent with the Bureau.

If a trade association does not receive a set of schedules within a few days, the Bureau said the proper officer should communicate with the nearest district office, or write the Marketing Research Division, Bureau of Foreign and Domestic Commerce, Washington, where a supply is available.

Veteran springmakers are balanced with the enthusiasm of youth...technically trained men with practical knowledge ..for a product of uniform, dependable quality, now, or years from now. The quality is Dunbar's, the products:
SPRINGS, WIRE FORMS, SMALL STAMPINGS

Send your Springquiries to

DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT

American Smelting & Refining Co., Chicago, announces removal of its Federated Metals Division to 123rd Street and Indianapolis Boulevard, Whiting, Ind.

Employment in Durable Goods Industries Rises

WASHINGTON.—The Labor Department reports that employment during August in the durable goods industries increased for the first time in 10 months, by about 2 per cent.

"Steel mills expanded their forces by 6500, electrical machinery plants by 3700 and there were substantial gains in foundries and machine shops, furniture factories and sawmills," according to the department. "In the automobile industry employment was reduced by about 18,000, primarily because of shut-downs for model changes," it said.

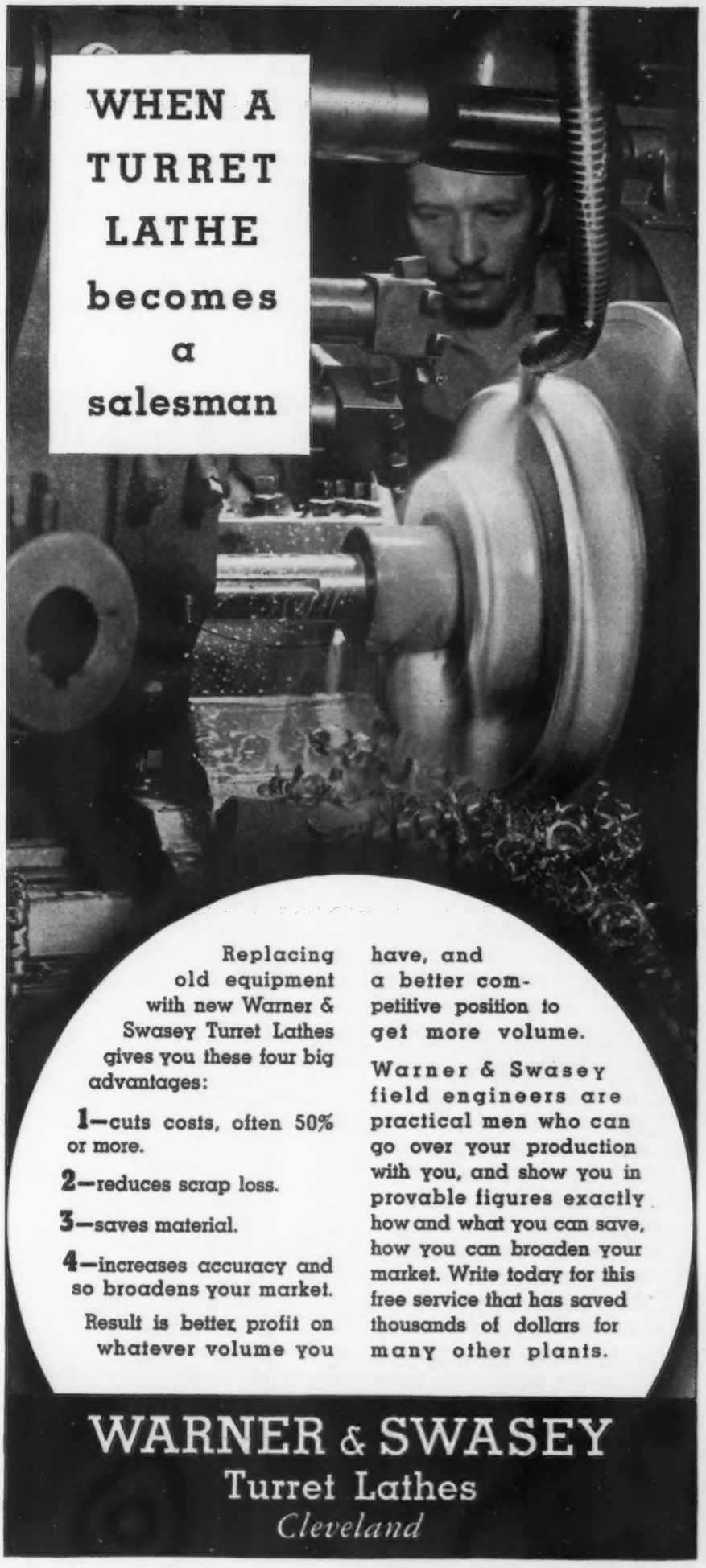
Week's Steel Buying for U. S. Totals $116,423

WASHINGTON.—The Walsh-Healey Public Contracts Board reports that Government contracts for iron and steel products totaled $116,423.12 during the week ended Sept. 22, and for machinery $391,622.50. The awards follow:

The E. L. Essley Machinery Co., Chicago, honing and lapping machinery	$55,170
Lloyd & Arms, Inc., Philadelphia, lathes	18,700
E. W. Bliss Co., Brooklyn, vertical presses	12,045
E. W. Bliss Co., Brooklyn, vertical presses	23,295
American Type Founders Sales Corp., Washington printing presses	11,667
Hurd Lock & Mfg. Co., Almont, Mich., pad locks and latches	13,041
Crane Co., Washington, valves	11,081
Camden Forge Co., Camden, N. J., racks and pinions	218,290
Poor & Co., Canton Forge & Axle Works, Canton, Ohio, drop forgings	17,812
Florence Pipe Foundry & Machine Co., Philadelphia, water pipe	42,000
Joseph T. Ryerson & Son, Inc., Chicago, concrete bars, reinforcing	18,500
Enterprise Galvanizing Co., Philadelphia, beams	24,810
Wisconsin Bridge & Iron Co., Milwaukee, guides and frames	13,300
Cincinnati Milling Machine, Cincinnati, profiling machine	28,421

New CIO, Willys-Overland Contract Bans Pay Cuts

A NEW wage contract between Willys-Overland Motors, Inc., Toledo, Ohio, and Local 12, United Automobile Workers, has been signed to replace the previous contract which expired Aug. 1. Under the new agreement wage cuts are banned for the year, some small increases have been granted to 250 workmen in the lower wage brackets, and provisions for discussion of any grievances have been broadened.


WHEN A TURRET LATHE becomes a salesman
Replacing old equipment with new Warner & Swasey Turret Lathes gives you these four big advantages:
1—cuts costs, often 50% or more.
2—reduces scrap loss.
3—saves material.
4—increases accuracy and so broadens your market.
Result is better profit on whatever volume you have, and a better competitive position to get more volume.
Warner & Swasey field engineers are practical men who can go over your production with you, and show you in provable figures exactly how and what you can save, how you can broaden your market. Write today for this free service that has saved thousands of dollars for many other plants.
WARNER & SWASEY
Turret Lathes
Cleveland

Centralized Management of Material Handling

(CONTINUED FROM PAGE 23)

tions. Two more fork trucks were purchased, one to be placed in the lightning arrester department and one in the shipping department. Thus the flow of materials on pallets could continue uninterrupted from the source of raw materials, at the receiving department, through the stockrooms to the factory floor, and then to the warehouse, ready for shipment.

The problem of materials coming in on pallets was easily solved in this instance, since the Schenectady Works supplied the porcelains and cooperated splendidly in the use of fork trucks. As a result, the Schenectady Works saves carloading expense—and Pittsfield profits when unloading by reducing handling costs by 75 per cent. This saving is explained by the fact that a fork truck picks up 14 porcelain trays on a pallet (Fig. 4) as quickly as two men pick up one tray by hand.

As the porcelains are unloaded they are placed on yard trailers, two pallets to a trailer, and delivered to the lightning arrester stockroom. At this point the pallets are removed from the trailers and stacked until needed (Fig. 5), again with a saving of 75 per cent (30 per cent less floor space is used than with the former method.) When ordered, these porcelains are delivered from the stock piles to the factory floor (Fig. 6) once more by fork truck with yet another reduction in handling. And they are still on the original pallets as loaded in Schenectady—50 miles away.

Another raw material used in lightning arresters is "red lead." This material, since it is handled in cumbersome barrels, presented a problem. But handled four barrels to the pallet (Fig. 7) with the aid of fork trucks, the problem disappeared.

During the manufacturing process the lightning arresters remain on conveyors, but the fork truck resumes the handling after the finished arresters are packed for shipment. As the cartons come off the assembly line, they are packed on pallets which prevent crushing of the cartons even when stacked four pallets high (Fig. 8). Due to the use of braces between the pallets, the upper loads bear directly on the floor rather than add cumulative pressure to the cartons at the base.

These pallets (which actually consist of two pallets framed together) are now loaded on semi-trailers (Fig. 9), eight double-pallets to a trailer, and delivered to the warehouse, where the shipping department's fork truck unloads and stacks them (Fig. 10). Formerly, these cartons were all handled singly from trailers to the stock piles, but now a fork truck unloads and stacks 210 cartons in one easy operation.

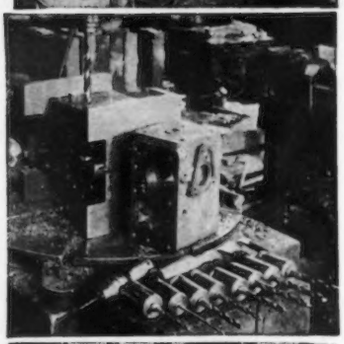
The cycle of lightning-arrester operations within the works is finally completed when the warehouseman takes the pallets from the piles and delivers them to outgoing cars.

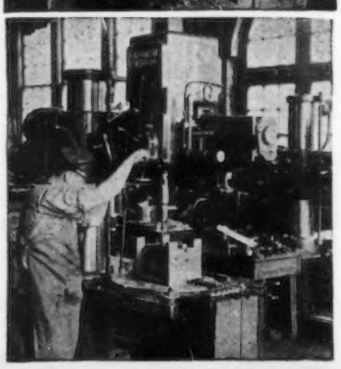
Other Problems

Of course, centralized management and study and fork trucks and unit loads are not the whole of successful materials handling. Other problems constantly arise. For example, formerly when trucks and tractors came into the central transportation yard at

SUPER-SERVICE RADIALS

The First Three Led to 12 More High-Speed Super-Service Radials





● These views show a few of the 15 High-Speed, All-Geared Super-Service Radials recently installed by a nationally-known manufacturer whose work includes a variety of jobs like the one shown in the center photograph. Operations in sequence are as follows: Drilling—six 9/16", seven 13/32", and 7/16", one 3/8", one 15/16", one 29/64", one 21/64", one 3/16", one 1/2", one 1/4", two 1/8"—23 HOLES PER PIECE IN ELEVEN DIFFERENT SIZES.

In addition, eight holes are tapped. Ability to change over quickly in order to handle a wide range of hole sizes economically on Super-Service Radials makes their use particularly advantageous. Their speed and ease of handling will inspire your operators.

Ask our engineers to show you all the benefits of these modern machines.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY, CINCINNATI, OHIO

CINCINNATI BICKFORD

Pittsfield (Fig. 11) it was the practice for the driver to leave his load and come inside the transportation building to receive instructions from the dispatcher. Very recently a unique installation—a voice-amplification system—has meant savings. Now the dispatcher, sitting at his desk, merely speaks into a microphone (Fig. 12) and his instructions are carried to the drivers anywhere in the yard. Men are sent to answer requests from outlying departments, loads are switched, and questions are asked—all by loudspeaker.

Steel Payrolls Top 1934 Depression Low

EMPLOYMENT and payrolls of the steel industry during the first half of 1938 were substantially higher than in the corresponding periods of 1934 and 1935 when operations were also below 50 per cent of capacity. Output in the first six months of this year, however, was about one-third lower than in either of the two earlier periods.

These facts were revealed in a recent study by the American Iron and Steel Institute of production, employment and payroll reports covering the past five years.

A sharp decrease in output per man accompanied by a marked increase in payroll costs per ton of steel produced is indicated by the figures.

An average of 449,000 employees, receiving pay of $285,835,000, were on the payrolls of the industry during the first half of 1938, or 5 per cent more than were employed in the corresponding period of 1934 and 7 per cent more than in 1935.

Production of steel ingots in the first half of this year, however, was 34 per cent below the first six months of 1934 and 32 per cent below the corresponding period in 1935. Rate of operations in the industry during the first half of this year was 31 per cent of capacity, which compares with 48 and 47 per cent, respectively, in the corresponding periods of 1934 and 1935.

Weirton Steel Orders 35-in. Blooming Mill

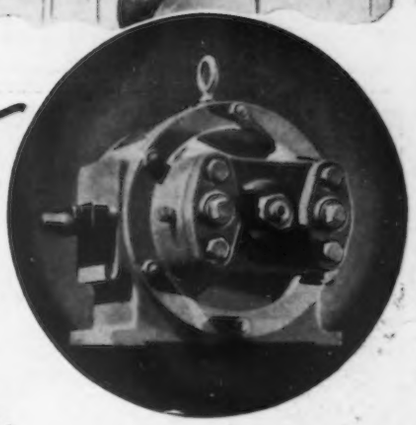
YOUNGSTOWN.—In line with the recently announced expansion plan, Weirton Steel Co., Weirton, W. Va., has let contract to Morgan Engineering Co., Alliance, Ohio, for a 35-in. modern blooming mill.

$2500 House Goal for Members Of Business Advisory Council

WASHINGTON. — Prentiss L. Coonley, Administration trouble-shooter on the Business Advisory Council and former NRA Deputy Administrator, is developing plans by which the Administration hopes to put a real dent in the admittedly tough job of large-scale construction of low-cost houses.

In his job of assisting W. Averill Harriman, chairman of the Advisory Council and board chairman of the Union Pacific Railroad, Coonley has conferred with representatives of the

Hele-Shaw Fluid Power is as *Self-Reliant* as an ALLEY CAT



Hele-Shaw Fluid Power is oil under pressure. Literally—the pumps, motors and transmissions take care of themselves. Running smoothly in a bath of oil, they are self-lubricating, constantly operating with immediate and automatic adjustment to any cycle of changing speeds, pressures, or direction.

Self reliance is *one* reason why so many machine designers, builders and buyers are specifying Hele-Shaw Fluid Power.

But there are other equally important reasons. Hele-Shaw Fluid Power increases production by instant and automatic adjustment to operating conditions. It offers wide flexibility of location. It sustains its pressures with a minimum loss of energy.

Write us for complete details. Ask us to show you how Hele-Shaw Fluid Power can be advantageously applied to the machinery you design, build, or buy. Specify Hele-Shaw.

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PUMPS, MOTORS & TRANSMISSIONS

A-E-CO Hele-Shaw FLUID POWER

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Stainless steel roller chain is the answer to conveying operations when rust and corrosion must be avoided.

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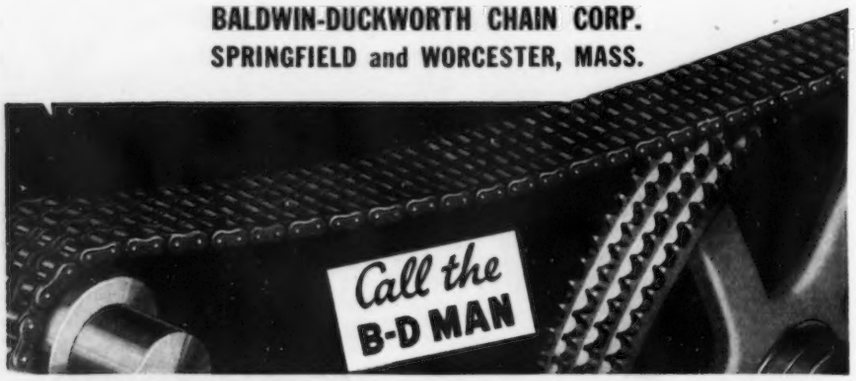
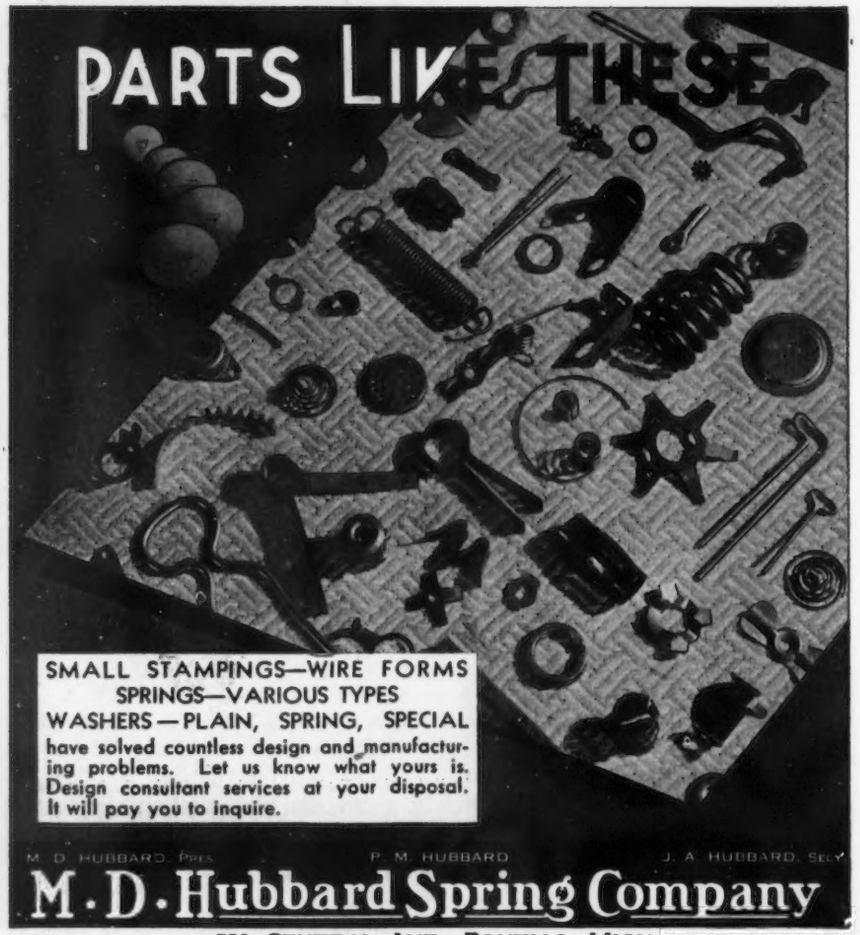
SPRINGFIELD and WORCESTER, MASS.





SMALL STAMPINGS—WIRE FORMS
SPRINGS—VARIOUS TYPES
WASHERS—PLAIN, SPRING, SPECIAL
have solved countless design and manufacturing problems. Let us know what yours is. Design consultant services at your disposal. It will pay you to inquire.

M. D. HUBBARD, Pres. P. M. HUBBARD J. A. HUBBARD, Sec'y.

M. D. Hubbard Spring Company

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building supply industry, Government officials, and outside housing authorities in a meeting described as bringing the group together for the first time. So far only theories have been discussed, Mr. Coonley told THE IRON AGE, but the heart of the program revolves around the possibility of applying mass production methods in the low-cost housing field and at the same time attracting the cooperation of private enterprise by getting away from Government subsidy as embodied in the United States Housing Authority program.

Rent For $25 Monthly

Coonley, who returned to Washington last spring with the purpose of making Government-business cooperation more than a myth, hopes through its efforts to lay the foundation for greater cooperation between private industry and the Government's housing agencies in a program which might involve 100,000 housing units, costing as little as $2,500 each and renting in the neighborhood of $25 monthly.

The Advisory Council spokesman emphasized that the plan hardly has reached the stage where it can be reported as actually taking definite shape but that it can be expected to follow roughly along these lines:

Houses would be built in units of 10 following standard specifications, costing around $2,500 per house and designed for construction on a production basis. Companies supplying building materials would be given orders for a definite number of units with the same price to apply on subsequent orders up to a certain number under the program. Materials would be handled by local building supply distributers who also would be committed to make concessions. Local labor would be employed on projects which would be under the wing of a joint national and regional authority with local corporations facilitating location of sites, financing construction and sales to investment groups interested in rentals. Proponents say that legislation would not be necessary to carry out the program.

Business representatives who conferred with Mr. Coonley at a meeting attended by at least a dozen key Administration officials include: Lewis Brown, president, Johns-Manville Corp.; L. R. Crandall, president, Fuller Construction Co., New York; Rolland J. Hamilton, president, American Radiator Co., New York; De Lancey Kountze, board chairman, Devoe & Reynolds Co., Inc.; John McC. Mowbray, president, Roland Park Co., Baltimore; D. M. Nelson, vice-president of Sears, Roebuck & Co., and chairman of the new textile commit-

tee named by the wage-hour administrator, Chicago; I. N. Tate, vice-president, Weyerhaeuser Lumber Co., St. Paul; Thomas W. Holden, vice-president, F. W. Dodge Corp., New York; and Robert Davison, director, John B. Pierce Foundation, New York.

British Enamelers Plan Visit to Eight U. S. Cities

CHICAGO.—In cooperation with the Porcelain Enamel Institute, the Institute of Vitreous Enamellers, London, is arranging a 10-day tour in the United States covering eight cities, 13 plants, and including two days at the Porcelain Enamel Institute Third Annual Forum, to be held Oct. 12 to 14, Urbana, Ill.

Plants to be visited, provided war in Europe does not interfere, include the Porcelain Enamel & Mfg. Co., and Baltimore Enamel & Novelty Co., both of Baltimore; Carnegie-Illinois Steel Corp., Irvin works, Clairton, Pa.; Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; American Rolling Mill Co., Middleton, Ohio; Chicago Vitreous Enamel Product Co.; Norge Corp., Muskegon, Mich.; Ford Motor Co. and Briggs Mfg. Co., Detroit; Ferro Enamel Corp., and Republic Steel Corp., Cleveland.

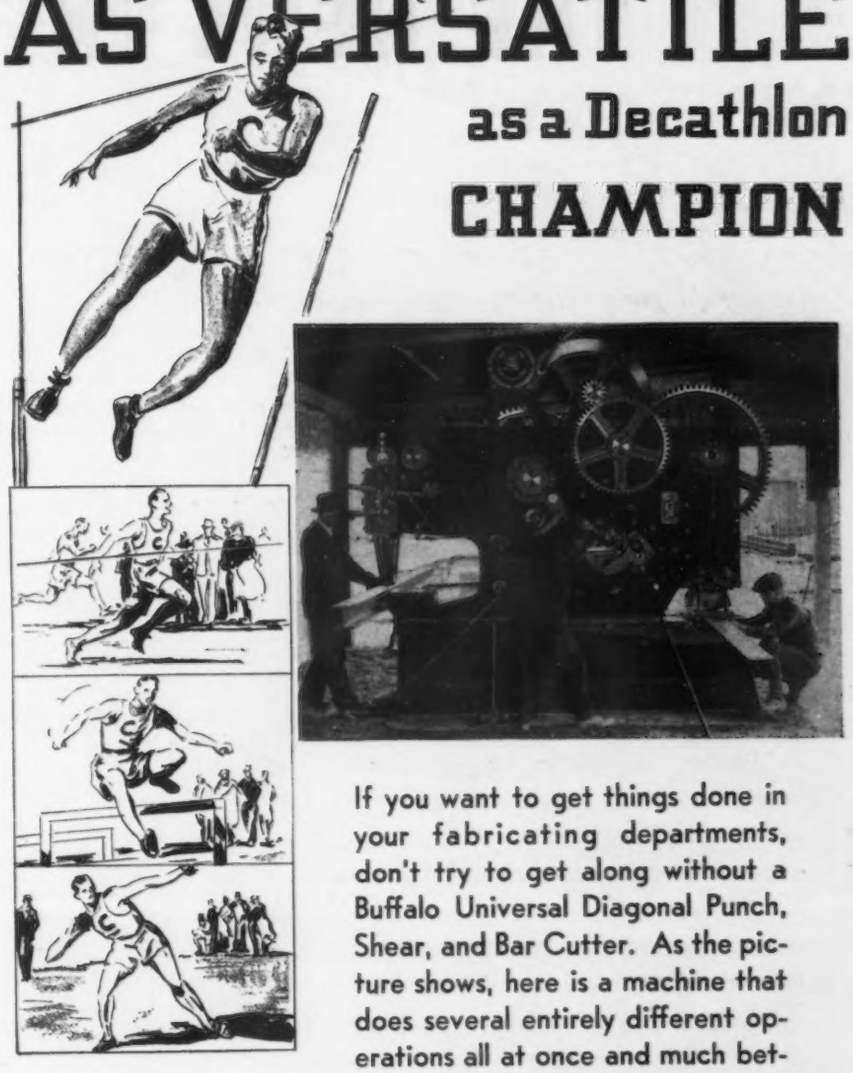
Steel Orders Still Rising, J. L. Perry Says

VOLUME of steel orders is increasing week by week and operations have advanced 50 per cent since the low of last June, John L. Perry, president of Carnegie-Illinois Steel Corp., told the Pittsburgh Chamber of Commerce at its meeting recently. Mr. Perry said that his company's new Irvin works at Clairton, Pa., should be operating in a short time.

Millsop on National Steel Committee

THOMAS E. MILLSOP, president, Weirton Steel Co., Weirton, W. Va., has been elected a member of National Steel Corp.'s executive committee. This committee is composed of the heads of the subsidiary companies and E. T. Weir, board chairman. National has declared a dividend of 25c. a share on its capital stock, payable Sept. 30 to record Sept. 23.

AS VERSATILE as a Decathlon CHAMPION



If you want to get things done in your fabricating departments, don't try to get along without a Buffalo Universal Diagonal Punch, Shear, and Bar Cutter. As the picture shows, here is a machine that does several entirely different operations all at once and much better and faster than can be done by ordinary methods. It handles Angles, Tees, Rounds, Squares, Flats—does punching, shearing, slitting, coping, notching.

The frames are made of "Armor-Plate" electrically welded steel.

There is a wide range of sizes. Why not send for our Bulletin 331 now—and make your iron working department more versatile, more profitable!

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"Buffalo" U. D.
PUNCHES, SHEARS, BAR CUTTERS

. . . THE NEWS IN BRIEF . . .

Lewis M. Lind, chief of Commerce Department's machinery division, to lead machinery discussion meetings at National Foreign Trade Convention.—**Page 38.**

Veteran employees of Allegheny Steel Co., at Brackenbridge, Pa., dedicate an ingot memorial to the late Harry E. Sheldon, long the company's president.—**Page 38.**

Automobile output swings upward, with 10 producers now assembling 1939 models . . . Ford sales manager predicts 25 per cent gain in sales of new cars . . . Ford to use cylinder bore liners.—**Page 42.**

Stanley A. Knisely, Republic Steel advertising manager, is elected president of National Industrial Advertisers' Association.—**Page 45.**

Annual reunion of former executives of Central furnaces of the American Steel & Wire Co., held at Canton, Ohio.—**Page 45.**

Free enterprise lifted America's standard of living to top, Charles R. Hook, American Rolling Mill Co. president, tells Management Congress.—**Page 46.**

2300 trade associations questioned on monopolies by government.—Page 48.

Government buying of steel products in the latest reported week totaled $116,423; machinery purchases totaled $391,622.—**Page 49.**

New CIO, Willys-Overland contract bans pay cuts.—**Page 49.**

Steel employment and payrolls in first half of 1938 were higher than in the like periods of 1934 and 1935, although ingot output this year was a third lower.—**Page 51.**

Federal Barge Line shipments increase sharply on Mississippi during August.—**Page ??.**

Weirton Steel Co. has awarded an order for a 35-in. blooming mill to Morgan Engineering Co., Alliance, Ohio.—**Page 51.**

Business Advisory Council weighs plans for developing $2,500 house through application of mass production methods.—**Page 51.**

British enamelers plan visit to eight United States cities.—**Page 53.**

Steel orders still rising says president of Carnegie-Illinois Steel Corp.—**Page 53.**

American Trade Association Executives meeting at Pittsburgh, have no fear of monopoly investigation, hope for thorough inquiry.—**Page 56.**

Business during November and December will be profitable, Frank R. Frost, president, Superior Steel Co., tells his stockholders.—**Page 57.**

No Jones & Laughlin Steel Corp. employee was involved in a fatal accident at its Aliquippa plant during the past year although seven were fatally injured outside the plant.—**Page 57.**

Chile considers dropping cotton machinery duty.—**Page 57.**

Steel Workers Organizing Committee begins an attack on Communism. "We're not Communists in theory, practice or deed," said Philip Murray, SWOC chairman. *Steel Labor*, SWOC publication, in its latest issue carries a cartoon picturing Stalin as a killer of "world labor."—**Page 59.**

Railroad scrap sales in 1937 were 5,700,000 tons.—**Page 60.**

Western Pennsylvania shippers forecast fourth quarter shipments of iron and steel products will equal the total for the like period of 1937.—**Page 60.**

H. G. Batcheller to have office in Pittsburgh.—Page 60.

United States exported 134,110 tons of steel in July, 137,276 tons in July and 408,081 tons in August 1937.—**Page 61.**

Inland Steel Co. to use Chicago as base.—**Page 61.**

A.S.T.M. will discuss research in industry.—**Page 61.**

Ford 1939 production to start Oct 3. —**Page 68.**

Orders for fabricated steel gain 18 per cent.—**Page 68.**

Germany said to be inquiring for American machine tools . . . Ford Motor Co. buying equipment for making cylinder bore liners.—**Page 81.**

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CONVENTIONS

Oct. 4 to 5—Society of Automotive Engineers, truck, bus and rail car meeting, Chicago.

Oct. 5 to 7—American Society of Mechanical Engineers, Providence.

Oct. 10 to 14—American Institute of Steel Construction, French Lick, Ind.

Oct. 12 to 14—Porcelain Enamel Institute, University of Illinois, Urbana, Ill.

Oct. 12 to 15—The Electrochemical Society, Rochester, N. Y.

Oct. 13 to 15—Society of Automotive Engineers, aircraft production meeting, Los Angeles.

Oct. 14 to 15—American Society of Tool Engineers, Pittsburgh.

Oct. 17 to 21—National Metals Congress, Detroit.

Oct. 21 to 22—Industrial Unit Heat Association, French Lick, Ind.

CONTINUOUS ROD AND MERCHANT MILL

DESIGNED AND BUILT BY

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WORCESTER
ENGINEERS AND
MANUFACTURERS

From Reheating Furnace through Roughing Trains and Looping Mills, continuous uniform production is assured by careful Morgan planning and meticulous attention to details. Morgan Construction Co., Worcester, Mass., U.S.A.

R45

Trade Group Leaders Hope for "Thorough" Monopoly Inquiry

PITTSBURGH.—Federal regulation of employer-employee relationship, the anti-monopoly inquiry, industry-government relations, and other live topics high-lighted the American Trade Association Executives annual convention here last week.

Prevalent throughout all papers presented was a plea for better understanding and cooperation between the Government and business.

In his annual report North Storms, president of the Trade Association Executives and secretary-treasurer, National Glass Distributors Association, Chicago, cautioned members "to be keenly receptive to change—change of every kind—change in our relationships with our own groups, in our relationships with Government, and in our relationships with the public."

Touching on the forthcoming investigation of trade associations by the so-called anti-monopoly committee, he said, "We are now in a maelstrom of speculation as to what may be before us, but I do not believe we need fear the minutest examination of trade associations, their structure, and their functions, for, by and large, the results of their many activities have been of decided benefit to the public, as well as the industry which supports them."

With regard to a Department of Commerce questionnaire regarding the structure and activity of trade associations, Mr. Storm declared "this questionnaire places upon us both a responsibility and an opportunity — a responsibility to help find the right answer in seeking a clarification and delineation of the legitimate spheres of activity of trade associations, and an opportunity to give the National Economic Committee (anti-monopoly) the additional knowledge we should like them to have along with the information they desire regarding trade associations."

In discussing Federal regulation of employer-employee relationship, John C. Gall, counsel, National Association of Manufacturers, expressed a view that substantial amendments to the National Labor Relations Act would be necessary in order to achieve the balance between employers and employees which is the essential feature of labor relations in Great Britain.

Concerning the report of the President's recent commission to investigate labor legislation and collective bargaining in England, Mr. Gall gave reasons why relatively few strikes occurred in England, some of which are as follows: "The Government is absolutely impartial as between the employer and his employees; unemployment benefits are not payable to strikers; the English people are devoted to law observance primarily, but to law enforcement if necessary; the British labor leader is ordinarily much more conservative than here; the procedure for calling strikes is very democratic; the employer cannot be forced by any governmental agency to negotiate with the strikers or their representatives during a strike."

In discussing the National Economic Committee inquiry, E. B. George, economist, Dun & Bradstreet, Inc.,

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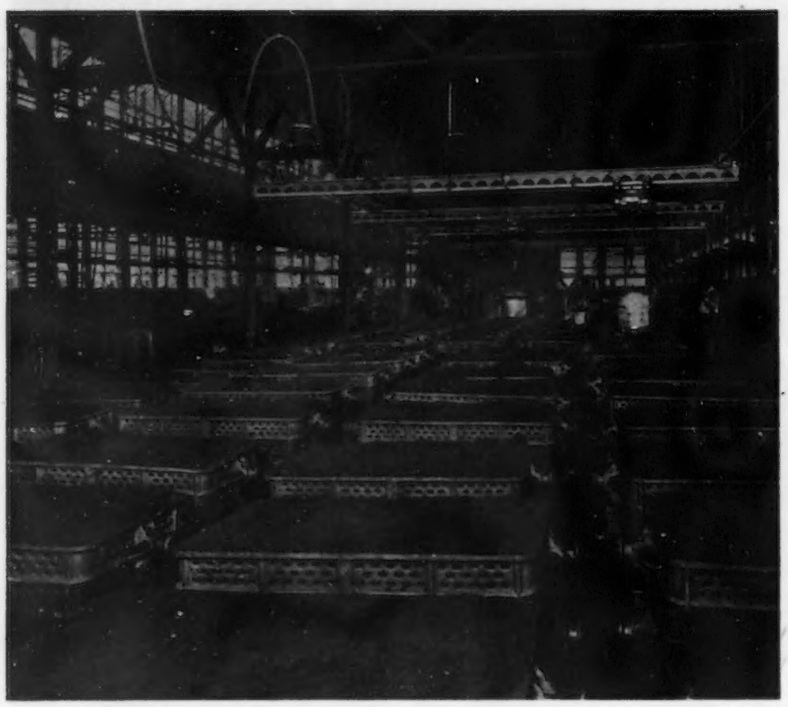
MATERIALS HANDLING EQUIPMENT



• This one shop of a large foundry produces two hundred molds per eight hour day. Castings are medium to one hundred and fifty pounds.

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New York, said in part ". . . One of the best things they (industry) can do is to use the last ounce of power or influence they may have to see to it that this investigation is long enough and thorough enough. The greatest danger of all, especially in view of the fact that the government files are already crowded with evidence of technical wrong doing, lies in a brief and superficial inquiry. Such an inquiry would be most likely to result in a vindication of preconceived ideas.

"On the constructive side, it is self-evident that no outcome can be good unless it is built on more facts and clarity concerning the true motive power and wastes of our economic system that are so far available. That means that it is not likely to be good unless business itself is an active partner in its conduct."

An additional feature of the trade association convention was a round table discussion of trade association activities. Among the speakers was John W. Hill, in charge of public relations, American Iron and Steel Institute, New York, who described the public relations activities carried on by the steel industry through the institute.

Chile Considers Dropping Cotton Machinery Duty

WASHINGTON.—The Chilean Ministry of Finance recently forwarded a project of law to the Congress of that country which would permit the duty-free importation of machinery, parts and tools necessary for equipping plants to manufacture cotton yarn and artificial silk thread and yarn, according to a report from the office of the American Commercial Attaché at Santiago. The importance of providing the new cotton yarn mills an opportunity to completely install necessary equipment by means of such exemptions was pointed out.

No Fatal Accident At J. & L. Plant In Year

TWELVE THOUSAND employees in Jones & Laughlin Steel Corp.'s Aliquippa plant have worked more than 14,000,000 man hours since Sept. 1, 1937, without a fatal accident, yet during the same period seven employees have been killed outside the plant. Automobile accidents accounted for five of the deaths, one man was murdered, and the other fell to his death from a second floor window of his home, the company reports.

Frost Sees Profits In Remainder of Year

PITTSBURGH.—"Business has improved during the last two months and it is expected that operations for the remainder of the year will be profitable," Frank R. Frost, president, Superior Steel Corp., Pittsburgh, told stockholders last week.

Stockholders of the company on Oct. 10 will vote on whether the company's bond indebtedness will be increased by $2,000,000, proceeds of which would be used to pay off and refund the company's indebtedness and to secure additional working capital. Money was borrowed last year to carry out an expansion program involving the installation of a 30-in. four-high modern cold mill and a 30-in. two-high cold mill with slitters, flatteners and other equipment including adequate and improved annealing and pickling facilities. This project has now been completed.

STAMPED ...by PARISH

A handsomely streamlined top casting for a household stoker, stamped out of 1/16th" hot rolled steel. Measures 33 3/8th" in length, 25 3/8th" in width, and the depth at the highest point is 7 1/2". Beauty and efficiency from one sheet of steel.

With all the svelte lines of a Paris creation, this stamping is destined to please the eye of a lady. More important to industry perhaps, it favored the purse of our customer.

Specialists in stamping, grounded in metal characteristics, we can serve you well—with style, quality and low price.

Permit us to review your requirements. No obligation incurred.

PARISH PRESSED STEEL CO.
READING, PA.
PACIFIC COAST REPRESENTATIVE, F. Somers Peterson Co., 57 California St., San Francisco, Cal.

..PERSONALS..

RALPH G. HARDING, chief of the Division of Metals and Minerals, Department of Commerce, has resigned, effective Oct. 1, to resume partnership in the firm of Wilbur Watson & Associates, architects and engineers, 4614 Prospect Avenue, Cleveland. Mr. Harding went to the division from the firm in August, 1934, and has given outstanding service to the iron and steel and allied industries in which he has an extensive acquaintance. Because of his familiarity and sound judgment regarding them, Mr. Harding was constantly consulted by executives in these industries on problems of domestic and export trade and was in frequent demand as a speaker.

❖ ❖ ❖

WILLIAM L. BATT, president of SKF Industries, Inc., Philadelphia, the first American to hold the office, was named president of the International Committee of Scientific Management last Friday in Washington at the conclusion of the meeting of the Seventh International Management Congress. He will serve throughout the next triennial International Management Congress which will be held in Stockholm, Sweden, in 1941. Mr. Batt succeeds the Right Honorable Viscount Leverhulme of England.

❖ ❖ ❖

JOHN H. ABBOTT has been announced as manager of alloy sales for the Rotary Electric Steel Co., Detroit, by JOHN S. ANDREWS, vice-president in charge of sales. Mr. Abbott brings to the Rotary Electric Steel Co. a wide knowledge of the alloy requirements of the automobile producers and parts makers in the Middle West. He has been associated with Timken Steel & Tube Co. in alloy steel sales for the past eight years in that territory. JAMES M. JOHNSON, for the past four years with Rotary Electric Steel Co., has been appointed manager of carbon sales, including cold drawn and hot rolled carbon and cold rolled strip steel.

C. L. VOLKMAN, whose appointment as manager of the fence post division of the Pollak Steel Co. was announced in these columns last week.

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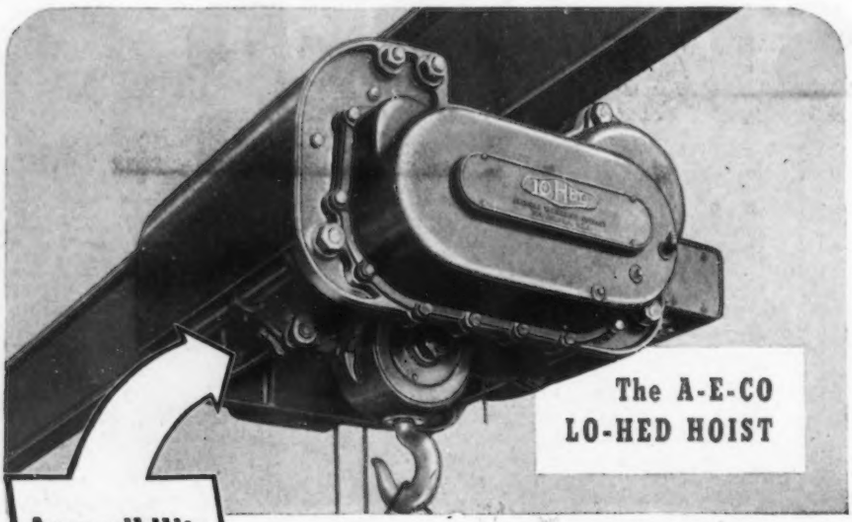
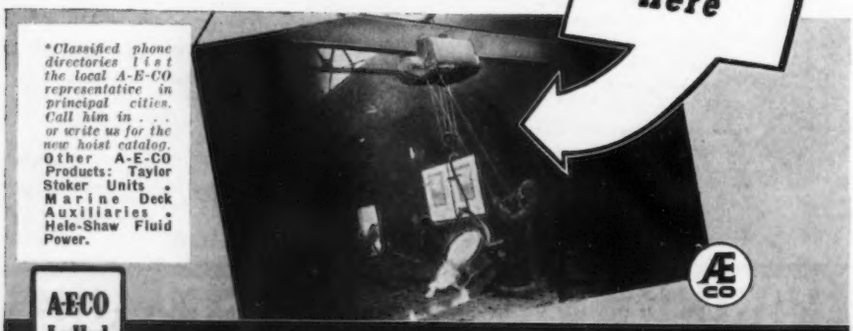
WILLIAM H. GIBB, of the Thomson-Gibb Electric Welding Co., Lynn, Mass., has established offices at 101 North 33rd Street, Philadelphia, from which he will serve the Philadelphia



Accessibility of Working Parts Here

Select THE hoist with the greatest accessibility of working parts. Ask the nearest A-E-CO representative* to show you how quickly the working parts can be reached if repairs are required. Ask him to explain Lo-Hed's exclusive features that mean dependable performance and lower maintenance cost. Let him show you Lo-Hed's uses in scores of industries. Find out *why* Lo-Hed is the logical hoist for EVERY purpose and *why* it is the *only* hoist for low headroom conditions. A-E-CO Lo-Hed HOISTS are built in many standard models, from ¼ to 12 ton capacities.

Reduces Handling Delays Here



*Classified phone directories list the local A-E-CO representative in principal cities. Call him in . . . or write us for the new hoist catalog. Other A-E-CO Products: Taylor Stoker Units • Marine Deck Auxiliaries • Hele-Shaw Fluid Power.

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territory. Mr. Gibb was founder and president of the Gibb Welding Machines Co., Bay City, Mich., until it was merged with the Thomson Co. in 1929 to form the Thomson-Gibb Electric Welding Co., of which he became vice-president. He resigned as vice-president in 1935, but continued on the board of directors. He then incorporated the firm of Gibb-Lewis Co., Chicago, to deal in patents and patented articles.

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V. A. HAIN, for 12 years Chicago district manager of the George J. Hagan Co., and more recently in a similar capacity with the Electric Furnace Co., has become sales manager of Flinn & Dreffein Co., Chicago

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F. J. HEALY has been appointed general manager of the Hygrade Lamp Division of the Hygrade Sylvania Corp., Salem, Mass. He has been identified with the company since 1917.

❖ ❖ ❖

ARTHUR ROEDER, president, Colorado Fuel & Iron Co., has been elected a director of the Alpha Portland Cement Co., Chicago, to succeed the late J. H. LOCKHARD, of Pittsburgh.

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DURBAN A. MCGRAW has become associated with the pig iron department of the Wieman & Ward Co., Pittsburgh. Previous to this appointment he spent some time at the Struthers furnace at Struthers, Ohio. After leaving school, he worked for a short period for Braeburn Steel Co., Braeburn, Pa.

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MILTON T. VREELAND, for a number of years identified with the Glidden Co., has joined the sales staff of the Hilo Varnish Corp., Brooklyn, N. Y. He will operate in Connecticut and a part of Massachusetts. MAX ALBERTS has been made trade sales representative in Texas, and ROY TEER, in New Orleans and vicinity.

❖ ❖ ❖

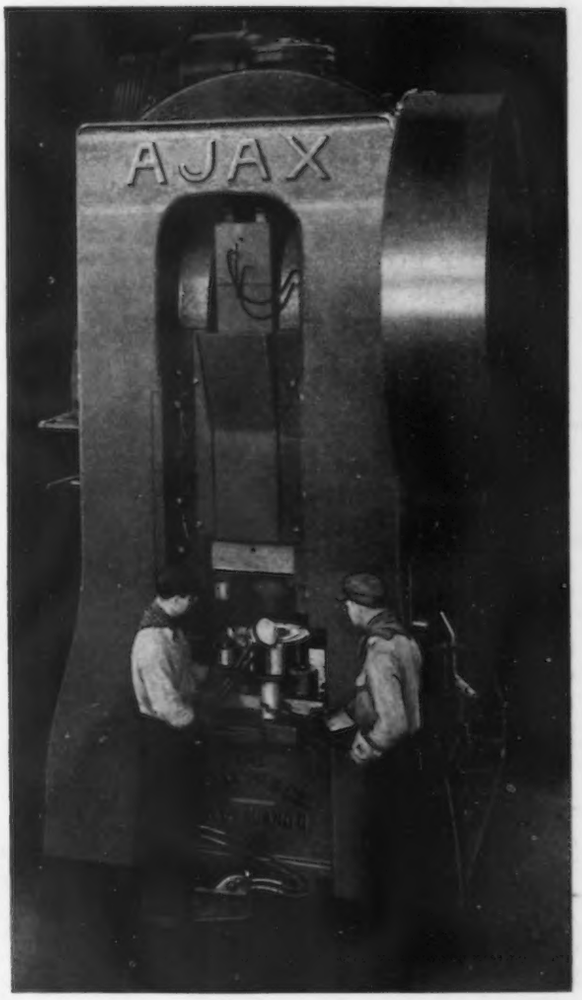
FRANK HODSON, consulting metallurgist, formerly connected with Electric Furnace Construction Co., Philadelphia, Empire Steel Castings, Inc., Reading, Pa., and Burden Iron Co., Troy, N. Y., has opened an office at 22 East 40th Street, New York.

SWOC Attacks Stalin; Murray Says, "We're Not Communists"

OFFICIALS of the Steel Workers Organizing Committee, an affiliate of John L. Lewis' CIO, this week apparently had taken steps to purge its ranks of Communists following widespread charges that members of that party hold important posts in various CIO unions such as the United Automobile Workers Union at Detroit.

While the *Daily Worker*, newspaper organ of the Communist party in this country, vigorously supports CIO unions and Communistic groups have described the CIO affiliates as "our unions," the current issue of *Steel*

Operating Speeds DOUBLED with AJAX *Air Clutch* SOLID FRAME FORGING PRESSES



★ These New Ajax Forging Presses have twice the speed of the fastest presses of equal tonnage 10 years ago. Their high speeds result in unforeseen advantages and economies which have greatly widened the range of practical press forging.

Deeper die impressions can now be filled sharply and due to the brief period of contact with the hot metal, die life is increased far beyond that obtainable on older presses. Increased output results from the quick clutch response making possible multiple operations without reheats. These factors all lead to a material reduction in production costs.

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Industry Speaks:

TOM M. GIRDLER, chairman, Republic Steel Corp.—"America is eating its seed corn. And all this is being done under the guise of liberalism. I have long been looking for a proper definition of the term 'liberal.' It is my observation that it applies chiefly to those who believe in being 'liberal' with the taxpayers' money."

HARLOW H. CURTICE, president, Buick division, General Motors Corp.—"Our contribution to economics is pretty much a matter of taking off our coats."

LEWIS H. BROWN, president, Johns-Manville Corp.—"Responsible labor leadership upholds the principles on which rests the American system of free enterprises. It accepts the fact that labor can prosper only as industry prospers. It understands that high wages are dependent on efficient tools and that those who provide the tools are entitled to a fair return for their hire."

Industry Listens:

"The time has come to talk business."—REICHSFUEHRER ADOLF HITLER.

"The supreme desire of the American people is to live in peace. But in event of a general war they face the fact that no nation can escape some measure of the consequences of such a world catastrophe." — PRESIDENT ROOSEVELT.

"I like to think all the time that the Treasury is ready for anything that might happen; as far as it is humanly possible it is ready." — HENRY MORGENTHAU, JR., Secretary of the Treasury.

Labor, the SWOC publication, bitterly attacks Communism.

Over a cartoon representing Stalin, the Russian dictator, holding a sword in wait for an approaching girl symbolizing "world labor," *Steel Labor* carries in bold type a statement by Philip Murray, SWOC chairman, that:

"We are not Communistic in theory, in practice or deed. We are ordinary citizens—members of the United Mine Workers of America—assuming the responsibility of trying to help our country and the people living in this country. That is our task." (Mr. Murray's statement was made before a mine union meeting at Fairmont, W. Va.)

While CIO leaders heretofore were silent on charges regarding their followers who are Stalinists, Van A. Bittner, Chicago regional director of the SWOC, likewise this past week defended that CIO affiliate against what the SWOC publication described as "recent charges of Communism within the CIO." Said Mr. Bittner:

"Nobody has ever called me a Communist. They have called me a lot of other names, but never a Communist. The CIO also is just as near to Communism as Alf Landon is to the Presidency of the United States. The CIO will never be Communistic."

Railroad Scrap Sales in 1937 Were 5,700,000 Tons

AS the result of a survey, the publication *Railway Age* has estimated that the railroads of the country sold 5,700,000 tons of ferrous and nonferrous scrap during 1937, all but a small portion having been iron and steel.

Of the total amount of scrap sold, about 1,670,000 tons was first converted by the railroads into No. 1 melting steel according to the railroad classification of this grade (¼ in. and heavier, 18 in. or less in width and 4 ft. or less in length, free from attachments). The largest single item sold was old rails, which amounted to 1,167,000 tons. Next in quantity was scrap steel under ¼ in. thick, which totaled approximately 374,000 tons. Then came cast iron carwheels, totaling 321,878 tons. Wrought iron totaled 88,000 tons, axles, 122,000 tons, and uncut structural steel, 241,000 tons. The scrap wheels excluded material sold direct to manufacturers in exchange for new wheels.

Steel Carloadings for Fourth Quarter Predicted

OIL CITY, Pa.—Iron and steel carloadings for the fourth quarter in western Pennsylvania and nearby regions, are expected to be about the same as for the corresponding period last year, while total carloadings will be down approximately 6 per cent, according to reports submitted here last week at the Allegheny Regional Advisory Board quarterly meeting.

"It is the consensus of opinion that if war becomes a reality in Europe, most steel plants will experience an immediate drop in activity while awaiting clarification of the situation. Barring any such happenings, steel production will probably carry on its steady increase and more than likely end up the year at around 55 per cent for the country as a whole. Estimates, of course, are based on continuation of current demand for the general lines, plus a slight anticipated increase on automotive releases and additional placements by household appliance manufacturers, both of which have been quite low up to this point," Clem W. Gottschalk, assistant traffic manager, Jones & Laughlin Steel Corp., Pittsburgh, and chairman, Iron and Steel Committee of the Regional Board, told members.

Mr. Gottschalk further added, "The steel order picture is reassuring because of the broad base upon which it is resting. The orders supporting increasing production rate come from a wide variety of sources, and as a result, ingot production depends not on releases against automotive orders, but on actual production in less important lines where low inventories have forced in steel orders in response to direct consumer demand."

H. G. Batcheller to Have Office in Pittsburgh

PITTSBURGH. — Allegheny-Ludlum Steel Corp. has leased additional space in the Oliver Building, Pittsburgh, which will soon be headquarters for H. G. Batcheller, president. Managers of some specialty products and their forces will also be located in the new quarters.

Inland Steel Co. to Use Chicago as Base

THE Inland Steel Co., Chicago, has announced that Chicago will be used as a basing point for its products rather than Indiana Harbor, Ind., where its principal production is centered. In a letter to its customers, dated Sept. 22, the company explains its position as follows:

"During recent months the question has arisen repeatedly as to whether Inland would establish a basing point at Indiana Harbor, Ind., at which locality all of our open-hearth steel products are rolled. This matter has received careful consideration by our officials.

"With the exception of rails and joint bars, our prices heretofore have been announced f.o.b. Chicago or f.o.b. Gary. Inasmuch as freight rates from Indiana Harbor offer no advantage over these points, it is clear that such action would be of no benefit to steel buyers or to the company. In our judgment it would lead to unnecessary confusion and, therefore, would be entirely unwarranted.

"Indiana Harbor is in the Chicago switching district and henceforth our prices, with the exception of rails and joint bars, will be announced f.o.b. Chicago only. This necessitates the establishment of a Chicago basing point on sheets and tin mill products. Chicago freight rates are substantially the same as Gary and, therefore, this will have practically no effect on our delivered prices. However, we believe it justified in the interests of uniformity and clarification.

"In territories where our own prices are non-competitive we reserve the right to meet the prices prevailing at such points."

Steel Exports Hold Up During August

EXPORTS of iron and steel products from the United States in August amounted to 134,110 tons valued at $8,810,935 in comparison with 137,276 tons valued at $9,832,797 in July and 408,081 tons listed at $24,119,200 in August, 1937, the Bureau of Foreign and Domestic Commerce reports. Principal exports in tons were:

	August	July	Aug., '37
Pig iron	19,756	10,371	114,035
Plates	13,150	17,390	55,034
Rails	12,665	1,960	7,980
Black sheets..	11,949	14,730	28,075
Bars	11,838	9,397	14,656
Tin plate	9,163	12,802	29,170

Meanwhile scrap exports by the United States during August totaled 108,029 tons valued at $1,478,545, compared with 126,423 tons valued at $1,667,487 in July.

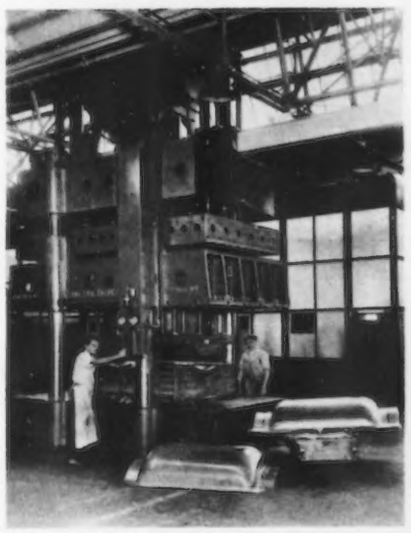
United States iron and steel imports during August totaled 18,404 tons, excluding scrap, and were valued at $1,182,741 compared with $955,215 of steel amounting to 14,094 tons imported during July. Receipts in the first eight months of 1938 aggregated 150,313 tons valued at $9,560,457 against 344,424 tons valued at $17,628,185 in the like period of last year. Hoops and bands represented the leading product imported and Belgium was the principal source. Imports of scrap in the first eight months of 1938 totaled 3441 tons (valued at $51,890) compared with 61,691 tons (valued at $845,045) in the like months of last year.

A.S.T.M. Will Discuss Research in Industry

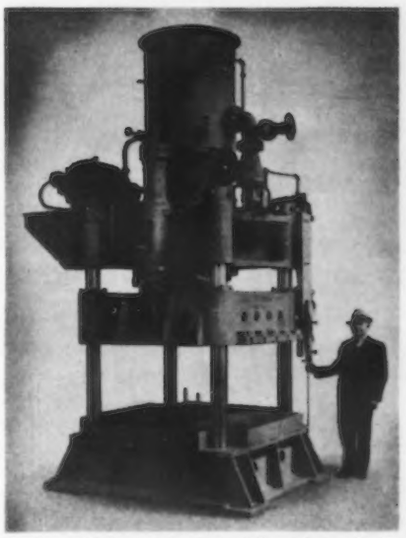
"FUNDAMENTAL Research in Industry" will be the subject for discussion at a dinner meeting to be held under auspices of the Philadelphia district committee of the American Society for Testing Materials at the Penn Athletic Club, Philadelphia, on Oct. 17. Dr. L. W. Chubb, director of research, Westinghouse Electric & Mfg. Co., will lead the discussion.

Curtiss Continues To

"PUT IT UP TO LAKE ERIE"



500 ton double action press used by Curtiss for deep drawing with wooden dies.



Another 400 ton press just delivered to Curtiss.

The satisfaction of Curtiss is typical of other metal working industries. By the same token, Curtiss REPEAT ORDERS are an indication of the 2 to 1 preference of the air craft industry for Lake Erie Hydraulic Presses.

They make possible the use of dies made of wood or other inexpensive materials . . . shallow forming dies using rubber pads . . . absolute control of working pressures . . . lower assembly costs.

You are invited to "Put It Up To Lake Erie."

2500 ton single action press in Curtiss plant for blanking and forming.

LAKE ERIE ENGINEERING CORP.

68H Kenmore Station BUFFALO, N. Y.

Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources

	August 1938	July 1938	August 1937	Eight Months 1937	Eight Months 1938
Steel Ingots: (gross tons)					
Monthly output[a]	2,546,988	1,982,058	4,861,789	38,193,090	15,348,190
Average weekly output[a]	574,941	448,429	1,097,469	1,100,030	442,056
Per cent of capacity[a]	42.85	33.42	83.55	83.75	32.94
Pig Iron: (gross tons)					
Monthly output[b]	1,493,995	1,201,785	3,605,818	26,811,269	10,568,806
Raw Materials:					
Coke output[c] (net tons)	2,544,571	2,220,2 2	4,629,862	37,056,796	19,985,229
Lake Ore consumed[d] (gross tons)	2,076,819	1,674,721	5,373,264	39,983,700	14,467,827
Castings: (net tons)					
Malleable, orders[e]	.....	16,905	49,376	425,587	.....
Steel, orders[e]	.....	36,641	54,753	724,742	.....
Finished Steel: (net tons)					
Trackwork shipments[a]	2,838	2,242	7,530	69,790	25,058
Fabricated shape orders[f]	102,539	87,154	124,897	1,202,037	679,793
Fabricated plate orders[e]	.....	27,773	31,763	301,488	.....
U. S. Steel Corp. shipments[g]	558,634	441,570	1,107,858	9,908,884	4,010,558
Fabricated Products:					
Automobile production[h]	96,936	150,444	405,072	3,779,451	1,553,412
Construction contracts[i]	$313,141‡	$239,799‡	$285,104‡	$2,100,358‡	$1,847,212‡
Steel furniture shipments[e]	.....	$1,480‡	$2,114‡	$18,622‡	.....
Steel boiler orders[e] (sq. ft.)	.....	691,371	937,240	7,452,319	.....
Locomotives ordered[j]	18	3	39	270	96
Freight cars ordered[j]	303	0	1,490	46,610	8,327
Machine tool index[k]	120.9	89.6	179.8	180.9	93.6
Foundry equipment index[l]	83.3	74.2	257.5	229.9	73.6
Exports: (gross tons)					
Total iron and steel[m]	.....	263,699	886,319	5,318,524	.....
All rolled and finished steel[m]	.....	100,671	489,723	2,917,022	.....
Scrap[m]	.....	125,399	473,933	3,028,795	.....
Imports: (gross tons)					
Total iron and steel[m]	.....	14,728	61,489	407,015	.....
Pig iron[m]	.....	936	7,952	76,127	.....
All rolled and finished steel[m]	.....	11,130	26,983	224,744	.....
British Production: (gross tons)					
Pig iron[n]	443,000	507,800	712,600	5,452,900	4,956,200
Steel ingots[n]	658,900	683,200	987,700	8,385,300	7,268,600

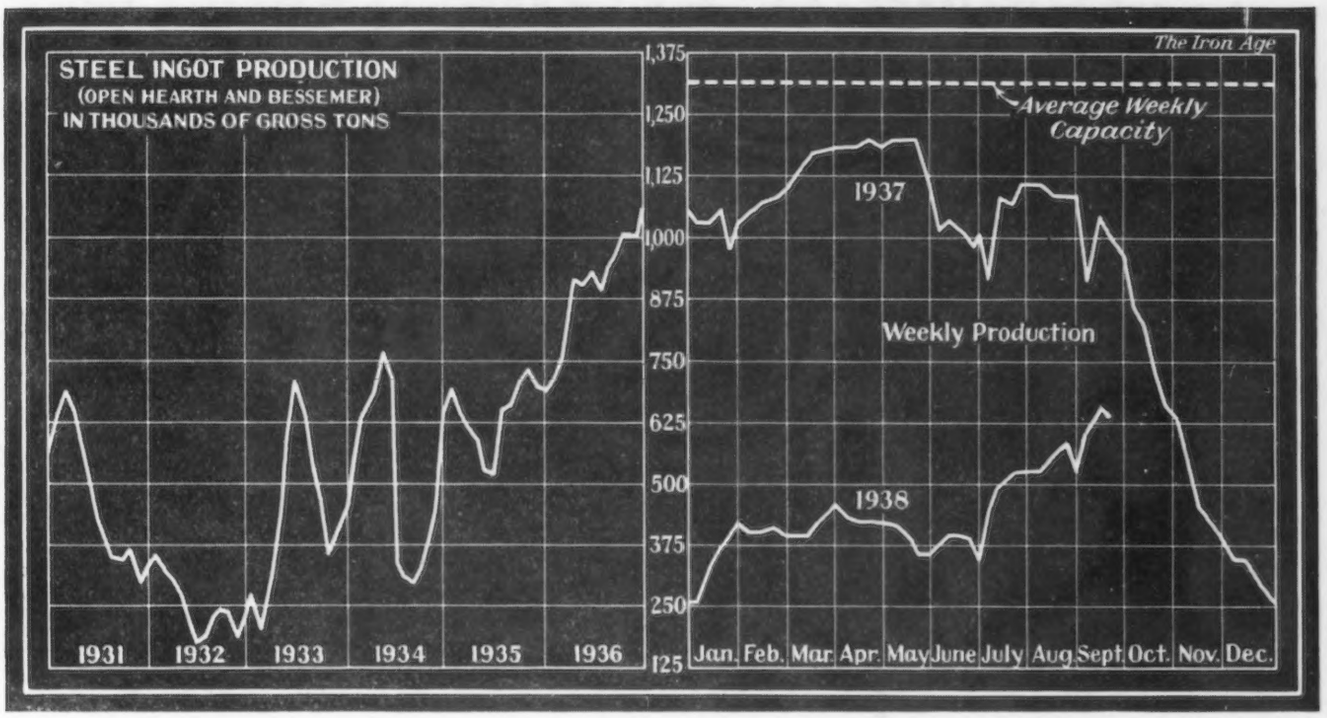
† Three months' average. ‡ 000 omitted.

Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] Preliminary figures from the Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; [i] F. W. Dodge Corp.—37 Eastern states; [j] *Railway Age;* [k] National Machine Tool Builders Association; [l] Foundry Equipment Manufacturers Association; [m] Department of Commerce; [n] British Iron and Steel Federation.

Weekly Booking of Construction Steel

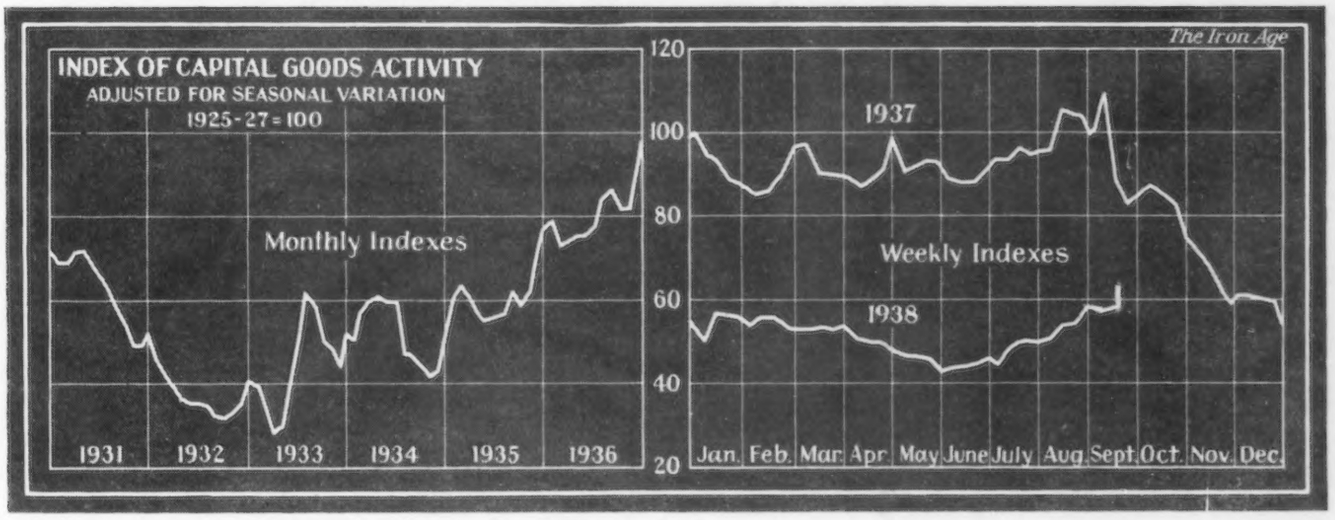
	Week Ended				Year to Date	
	Sept. 27, 1938	Sept. 20, 1938	Aug. 30, 1938	Sept. 28, 1937	1938	1937
Fabricated structural steel awards	22,225	66,590	21,600	18,115	624,945	863,510
Fabricated plate awards	1,015	1,555*	4,410	1,775	98,490	103,090
Steel sheet piling awards	.....	1,150	500	0	35,060	36,815
Reinforcing bar awards	6,185	17,910	5,525	6,225	240,100	216,540
Total Letting of Construction Steel	29,425	87,205	32,035	26,115	998,595	1,219,955

Steel Output Drops ½ Point to 47 Per Cent of Capacity



District Ingot Production, Per Cent of Capacity		Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
	CURRENT WEEK	38.0	41.0	45.0	30.0	51.0	75.0	49.0	64.0	46.5	43.0	40.0	46.5	50.0	**47.0**
	PREVIOUS WEEK	38.0	44.0	43.0	28.0	51.0	76.0	49.0	64.0	49.0	52.0	40.0	46.5	50.0	**47.5**

Index Rises to Highest Level Reached in 10 Months



BOLSTERED by gains in every component, THE IRON AGE index of capital goods activity rose to 62.6 in the week ended Sept. 24, the highest level reached in 10 months. The largest advance of the individual components was recorded by the construction series which moved up eight points in the week on the basis of the heaviest dollar volume of awards of the past 14 months. The Pittsburgh index was also notably stronger, the week's gain being the heaviest of any single week thus far this year.

	Week Ended Sept. 24	Week Ended Sept. 17	Comparable Week 1937	Comparable Week 1929
Steel ingot production[1]	65.6	64.6	109.0	118.8
Automobile production[2]	54.1	48.0	74.2	114.6
Construction contracts[3]	79.0	71.0	57.1	110.1
Forest products carloadings[4]	55.3	53.9	70.8	114.2
Production and shipments, Pittsburgh District[5]	59.0	55.3	103.2	119.5
Combined index	**62.6**	**58.6**	**82.9**	**115.4**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record;* 4. Association of American Railroads; 5. University of Pittsburgh.

. . . .SUMMARY OF THE WEEK. . . .

. . . War scare intensifies caution of steel buyers.

° ° °

. . . Ingot output off slightly; steel scrap marking time.

° ° °

. . . Pig iron price advance results in larger bookings.

WAR clouds obscure the business outlook. If war comes, considerable disruption and dislocation of trade would result, although the ill effects might not be so prolonged in the United States as was the case in 1914. From the outbreak of war in August, 1914, to the first quarter of 1915 there was a sharp downward trend in all major activities associated with the iron and steel industry, but the turn came by January, 1915. Steel ingot production started in that month at 40 per cent, compared with 25 to 30 per cent in November and December, climbed to 55 per cent by the end of the month, was at 65 per cent in March, 75 per cent or more by May and 90 per cent in July.

New business in steel has slowed down in some areas and for some companies during the past week's critical period in the European situation. To some extent this may be attributed to the war scare, which undoubtedly has intensified the spirit of caution among all buyers. However, there are other factors, notably the hurricane and flood devastation in New England, which has greatly hampered business in that section, and the slow upward trend of production of new automobile models. However, 10 producers are now assembling 1939 cars and steel requirements are expected to expand very shortly.

STEEL ingot production this week is off half a point to 47 per cent of capacity, the reduction of operations at some plants being accounted for by the fact that inventories of ingots and semi-finished steel have been built up to the point where no further additions are immediately advisable. It has been the practice of some plants to keep stocks of raw steel a little ahead of orders for finished products so that rush orders may be finished within the brief time that buyers are now willing to wait for deliveries. The sharpest contraction in ingot output is in the southern Ohio district, where the temporary shutdown of an open-hearth plant has brought the district average down from 52 to 43 per cent. At Chicago there has been a decline of three points to 41 per cent, Pittsburgh production is steady and the Youngstown district is up two points to 45 per cent. In other areas production is fairly steady.

Steel bookings in September were moderately above those of August, but the sharp upward trend of last month has been lacking. A noteworthy factor is the increasing insistence on quick shipments, indicating low consumed inventories in many instances. Orders are small and stocks are frequently replenished.

Although steel output has slipped a bit, pig iron production is expanding. A steel company blast furnace in the Chicago district has gone in and a merchant stack there is scheduled for resumption Oct. 1, while a merchant furnace at Sharpsville, Pa., was blown in Tuesday. A rebuilt steel company furnace at Youngstown is scheduled to operate within a week or so.

The advance of $1 a ton in pig iron prices announced by a Midwestern merchant producer on Sept. 20 to take effect Sept. 27 has been followed by a great many others, but has not yet become unanimous, one prominent Eastern seller having made no announcement. Bookings were fairly substantial, but shipments have yet to show a marked gain. Nevertheless, there is a gradual gain in the foundry melt in some districts.

Recent reductions in prices of rails and track accessories have not resulted in railroad inquiries other than the already known requirements of the New York Central, on which bids will be taken next week. However, the Illinois Central has ordered 1000 box cars on a lease-purchase basis from the American Car & Foundry Co., the Wheeling & Lake Erie has ordered five locomotives from the American Locomotive Co., and the Southern has bought four diesel-electric passenger trains from the St. Louis Car Co. This is more equipment business than has occurred within one week in some time.

STRUCTURAL steel lettings were upward of 22,000 tons, of which 11,430 tons is for the Delaware River aqueduct in Westchester County, N. Y. New work out for bids totals 21,000 tons. Reinforcing steel inquiries are about 8700 tons and lettings were 6200 tons. The American Bridge Co. was low bidder on transmission towers to connect the Grand Coulee and Bonneville Dams, to take about 18,500 tons of light shapes. National Tube Co. will supply about 8500 tons of 18-in. pipe for a 53-mile gas line from Utah to Wyoming.

Scrap is marking time awaiting the outcome of the European crisis. Shipments to Germany and Italy against recent large contracts would presumably cease if hostilities started. Meanwhile, Japan has bought 30,000 to 40,000 tons for shipment from the Pacific Coast.

THE IRON AGE scrap composite price is unchanged from last week at $14.25. The pig iron composite price has advanced to $20.44.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Sept. 27, 1938	Sept. 20, 1938	Aug. 30, 1938	Sept. 28, *1937
Rails, heavy, at mill	$40.00	$40.00	$42.50	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point.	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...

Cents Per Lb.:	Sept. 27, 1938	Sept. 20, 1938	Aug. 30, 1938	Sept. 28, *1937
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.35	$5.35	$5.35	$5.35

*Pittsburgh prices only.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$21.84	$21.84	$21.84	$25.76
No. 2, Valley furnace	**21.00**	20.00	20.00	24.00
No. 2, Southern Cin'ti	**21.06**	20.06	20.06	23.69
No. 2, Birmingham	**17.38**	16.38	16.38	20.38
No. 2, foundry, Chicago†	**21.00**	20.00	20.00	24.00
Basic, del'd eastern Pa.	21.34	21.34	21.34	25.26
Basic, Valley furnace	**20.50**	19.50	19.50	23.50
Malleable, Chicago†	**21.00**	20.00	20.00	24.00
Malleable, Valley	**21.00**	20.00	20.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.04
Ferromanganese, seab'd carlots	92.50	92.50	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh.	$15.25	$15.25	$15.50	$17.75
Heavy melting steel, Phila.	14.25	14.25	14.25	18.25
Heavy melting steel, Ch'go.	13.25	13.25	13.75	16.75
Carwheels, Chicago	13.75	13.75	14.25	18.00
Carwheels, Philadelphia	17.25	17.25	17.25	20.25
No. 1 cast, Pittsburgh	15.50	15.50	15.25	19.25
No. 1 cast, Philadelphia	16.25	16.25	16.25	20.25
No. 1 cast, Ch'go, (net ton)	12.75	12.75	13.25	13.50
No. 1 RR, wrot., Phila.	15.25	15.25	15.25	20.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.25
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Electrolytic copper, Conn.	10.375	10.375	10.125	13.00
Lake copper, New York	10.50	10.50	10.25	13.125
Tin (Straits), New York	**44.00**	43.70	43.30	57.875
Zinc, East St. Louis	4.95	4.95	4.75	7.25
Zinc, New York	5.34	5.34	5.14	7.60
Lead, St. Louis	4.95	4.95	4.75	5.85
Lead, New York	5.10	5.10	4.90	6.00
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	18.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
September 27, 1938	2.286c. a Lb.	$20.44 a Gross Ton	$14.25 a Gross Ton
One week ago	2.286c.	19.61	14.25
One month ago	2.300c.	19.61	14.50
One year ago	2.512c.	23.25	17.58

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1938	2.512c., May 17	2.300c., July 6	$23.25, June 21	$19.61, July 6	$14.83, Aug. 9	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . . PITTSBURGH . . .

. . . Ingot output steady . . . Steel sales about 15 per cent over those of August . . . War scare causes caution . . . Pig iron advanced $1 a ton.

PITTSBURGH, Sept. 27.—Ingot output in the Pittsburgh district this week holds unchanged at 38 per cent, while the Wheeling-Weirton district is down one point to 75 per cent. Supported largely by semi-finished steel, wire product and reinforcing bar demand, orders so far this month are 15 per cent or more ahead of the volume booked in the corresponding period last month. Although flat rolled tonnage is still far from satisfactory, total steel business in the past week was a shade greater than the previous week but the increases were largely of a semi-finished character.

Opinion here prevails that the European situation has caused a sharp note of caution to prevail among buyers, but should the war threat be removed, it is expected that conditions will improve steadily in line with earlier expectations.

Pig iron producers in this district have advanced prices $1 a ton, effective Sept. 27, and most customers have been covered.

Pig Iron

Local producers have advanced pig iron prices $1 a ton, effective Sept. 27. Consumers have had a week in which to make contracts at the old price. Consumption has increased some during the past few weeks due to miscellaneous demand, and shipments so far this month show a moderate increase from a month ago.

Semi-Finished Steel

New business in the past week increased sharply from a week ago, which further reflects the low point of non-integrated consumers' inventories. Prompt delivery is an important factor in the current market.

Bars, Plates and Shapes

Hot rolled bar tonnages are on a par with a week ago and demand continues miscellaneous. Structural inquiries and awards are not as numerous as a week ago, although a considerable amount of Government work is pending.

Cold Finished Bars

Cold finished bar makers have reaffirmed present prices for fourth quarter delivery. New business is slightly more active than a few weeks ago but total tonnages are not large.

Reinforcing Bars

Total awards and inquiries in the past week were not impressive but producers look for a satisfactory tonnage in the future, owing to publicly financed projects. Prices appear to be fairly well stabilized in most instances.

Bolts, Nuts and Rivets

Bolt and nut prices have been reaffirmed for fourth quarter delivery. Local plants are fairly active, with the major part of the support coming from fabricating shops.

Sheets and Strip

Aggregate bookings were off slightly in the past week owing to absence of important automotive buying. Miscellaneous demand continues about as strong as a week ago. Strip makers noted a moderate increase in their business during the past few weeks, owing to miscellaneous and automotive demand.

Tin Plate

Operations are estimated this week at 25 per cent and consumers are continuing a strictly hand-to-mouth buying policy. A formal tin plate price announcement is not looked for until possibly the end of this year. In the past, announcements have been made as late as mid-December.

Wire

Current wire bookings are equally as good as a week ago and are holding recent gains. Mills are operating from 50 to 55 per cent with honors about equally divided between merchant products and manufacturers' wire.

Tubular Goods

Oil-country goods specifications are no better than a week ago but orders so far this month are in slightly larger volume than in the corresponding August period. Seamless and electric weld pipe producers have added 10¾ in. o. d., 32.75 lb. and 8⅝ in. o. d., 28 lb. oil casing to the recently established grade B classification, which calls for a minimum yield point of 40,000 lb. per sq. in. This classification is $7.50 a ton less than the C grade of 55,000 lb. yield. Seven in. o. d., 28 lb. casing has been removed from the B classification.

REINFORCING STEEL

AWARDS

NORTH ATLANTIC STATES

650 Tons, Johnstown, Pa., flood control project, Conemaugh River, to Bethlehem Steel Co., Bethlehem, Pa., through Freeland, Inc., Pittsburgh, contractors.

150 Tons, Westport, Conn., highway project, to Truscon Steel Co., New York, through A. I. Savrin, East Hartford, Conn.

125 Tons, Cambridge, Mass., city sanatorium addition to Northern Steel Co., Boston; Grid Flat Slab Corp., contractor.

120 Tons, Danbury, Conn., hospital, to Truscon Steel Co., Boston; Michael A. Conner Co., Hartford, contractor.

120 Tons, Yeadon, Pa., addition to school, to American Steel Engineering Co., Philadelphia; through M. & L. Construction Co., Philadelphia.

100 Tons, Lowell, Mass., underpass to Northern Steel Co., Boston; Colman Brothers, Boston, contractor.

CENTRAL AND WESTERN STATES

400 Tons, Wahjamega, Mich., hospital, to Great Lakes Steel Corp., through Concrete Steel Fireproofing Co., Detroit; Kutsche Construction Co., Detroit, contractor.

380 Tons, Winona, Min., Froeder Grain & Malting Co. building, to Inland Steel Co.

280 Tons, Milwaukee, Froeder Grain & Malting Co., building, to Inland Steel Co.

270 Tons, Evansville, Ind., water works improvement, to Laclede Steel Co., St. Louis, through A. G. Ryan & Sons Co., Evansville, Ind., contractor.

200 Tons, Cedar Rapids, Iowa, Eighth Avenue bridge, to Joseph T. Ryerson & Son, Chicago, through Koss Construction Co., contractor.

170 Tons, Glencoe, Ill., new central school, to Republic Steel Corp., Cleveland, through O. J. Dean, Chicago; Coath & Goss, Chicago, contractors.

125 Tons, Detroit, Salvation Army building; J. A. Utley, contractor.

100 Tons, Milwaukee, grain elevator, Fleischman Malting Co., to Laclede Steel Co., St. Louis; through McKinzie-Hague, contractor.

200 Tons, Eutaula, Okla., bridge, FAP-21-(8) 6, to Sheffield Steel Corp., Kansas City; through Moran & Buckner Co., contractor.

160 Tons, Burton, Ohio, east branch dam for City of Akron, to Truscon Steel Co., Youngstown.

700 Tons, Vernon, Cal., Swift & Co., to Truscon Steel Co., Los Angeles; Austin Co., Los Angeles, general contractor.

530 Tons, Oakland, Cal., High Street bridge to Alameda, to Gilmore Fabricators, Inc., San Francisco; MacDonald & Kahn, San Francisco, general contractors.

395 Tons, Antioch, Cal., Central Valley project (Invitation B47252-A), to Bethlehem Steel Co., San Francisco.

259 Tons, Redding, Cal., Central Valley project (Invitation B47251-A), to Columbia Steel Co., San Francisco.

235 Tons, San Francisco, Dwight Edwards Co. plant, to Ceco Steel Products Co., San Francisco; Cahill Brothers, San Francisco, general contractors.

220 Tons, Eugene, Ore., post office, to Truscon Steel Co., Portland, Ore.; George Isaacson Iron Works, Portland, general contractor.

155 Tons, Redwood City, Cal., court house and county office building, to Bethlehem Steel Co., San Francisco; H. H. Lawson, general contractor.

143 Tons, Crownover, Wash., Yakima-Roza project, to Colorado Fuel & Iron Co., Denver.

NEW REINFORCING BAR PROJECTS

NORTH ATLANTIC STATES

700 Tons, New York, Criminal Courts building and prison; bids in.

500 Tons, Woodbridge, N. J., Pennsylvania Railroad grade elimination project, J. A. Stewart & Co., New York, low bidders.

500 Tons, Providence, parcel post building.

450 Tons, Philadelphia, girls' parochial high school, McCloskey & Co., Philadelphia, low bidder.

400 Tons, Taughannock Falls, N. Y., mesh, highway project R.C. 3997; bids close Oct. 11.

304 Tons, Schenectady County, N. Y., mostly mesh, highway project R.C. 3996; bids close Oct. 11.

300 Tons, Pawling, N. Y., mesh, highway project R.C. 3994; bids close Oct. 11.

300 Tons, Medford, Mass., sewer.

221 Tons, Hartford, Conn., Putnam Street school.

200 Tons, New York, Treasury Department supply requirements.

200 Tons, Bridgeport, Conn., bulkhead, United Illuminating Co.

160 Tons, Lexington, Mass., sewer.

150 Tons, Tioga County, N. Y., mostly mesh, highway project R.C. 3999; bids close Oct. 11.

120 Tons, Cambridge, Mass., municipal garage.

100 Tons, North Adams, Mass., school.

100 Tons, Aspinwall, Pa., U. S. Veterans' Hospital.

100 Tons, Hamburg, N. Y., sanatorium, bids due Oct. 4.

CENTRAL AND WESTERN STATES

1400 Tons, Chicago, apartment building, 50th & East End Avenue.

575 Tons, Oklahoma City, state highway bridge.

260 Tons, Columbia, Mo., State Cancer Hospital; Dickie Construction Co., St. Louis, low bidder on general contract.

140 Tons, Dogtooth Bend, Mo., Government project in St. Francis Levee District; Stiers Brothers Construction Co., St. Louis, low bidder on general contract.

100 Tons, Bloomer, Wis., sewage disposal plant.

300 Tons, Rock Island, Ill., reservoir, bids in.

140 Tons, Columbus, Ohio, Fifth Avenue bridge over Olentangy River. Bids Sept. 30.

115 Tons, Clark County, Ohio, Mad River Township, proposal No. 3, unit 2. Bids Oct. 4.

720 Tons, Methow, Wash., 6 bridges on State Road 16; Roy L. Bair, Spokane, Wash., general contractor.

105 Tons, Crownover, Wash., Yakima-Roza project (Invitation A33764-A); bids in.

. . . . CHICAGO . . . .

. . . Ingot output declines three points to 41 per cent . . . Pig iron making gains . . . Steel sales dip in some products . . . Labor strife again a factor . . . Little railroad buying expected in near future.

CHICAGO, Sept. 27—Ingot output fell three points this week to 41 per cent of the district's capacity, three of the five major mills participating in the decline. A steel making blast furnace was added last week end and a merchant stack is scheduled to go into blast Oct. 1.

Sales of finished steel for the past week were running about equal to or below the previous seven-day period while for the month to date some sales offices report losses of 15 per cent and more. When pig iron bookings were added, however, some tonnage reports were considerably higher than for the prior period.

The Chicago Federal Reserve Bank survey indicated a sharp rise in output of steel and malleable foundries and stove and furnace factories in August. Sales of farm equipment are little improved, though crop markets are increasing. Full production of many 1939 automobiles is anticipated some time in October.

Labor again is important in this area, with chief attention perhaps being focused on the railroad strike vote and wage cut. Neither side has given an inch to date, and it appears that a Presidential emergency board will be necessary to deal with the situation. Law provides for 60 days from the time a commission is appointed before an actual strike may take place, thus Dec. 1 is the earliest any such action could be taken. Until this condition is improved, little railroad buying of importance is expected.

The Nash motor plants in Milwaukee and Kenosha, Wis., have been closed pending solution of a union dispute in Racine, where the Nash plant was closed temporarily by the company in an economy move. Pickets are preventing the moving of essential materials from the Racine plant to Kenosha for the manufacture of new model cars. Some talk has been heard to the effect that Nash-Kelvinator Corp. may leave Wisconsin altogether because of labor difficulties.

New low prices on rails and track accessories are not expected to stir up much business, and at this writing a decrease in prices of light rails to maintain the previous differential with standard rails does not appear to be likely soon. Other prices are firm except galvanized sheets and reinforcing bars, which though still shaky in certain districts, are considerably improved in general.

Pig Iron

Since the advance of $1 a ton last Tuesday afternoon, the pig iron market has been very active. Covering for fourth quarter needs is general, and marks the first widespread departure from the policy of buying only for immediate requirements in many months. Foundry coke shipments are better, the activity of the past week having completely erased the poor showing of early September. A Federal furnace of the Interlake Iron Corp. will be placed in blast about Oct. 1, the first to operate in this plant since May. Gary works of Carnegie-Illinois added a blast furnace over the past week end.

Wire and Wire Products

Most encouraging at the moment is the almost definite prospect, according to certain wire consumers, of automobile specifications the first week in October. Some preparatory work has been started with this eventuality in mind. Efforts are being made by producers to get larger stocks in the hands of customers, so as to stave off in advance as much of the anticipated sudden rush to the mills as possible. Rural and farm equipment buying is expected in greater volume later in October.

Sheets and Strip

Orders from Detroit are not large. Hope is held for increased auto business early in October. Moderately good demand continues for strip.

Plates

Little tank building activity is reported and railroad demand is dead. Structural fabrication for bridges, viaducts, etc., is of most importance

currently to plate mills. Nineteen hundred tons of dredge pipe will be required for an irrigation project in Nebraska.

Bars

Orders have been increasing slightly for several weeks because of better operating schedules at plants of forgers, auto parts suppliers, etc., and improved jobber sales. Farm implement and tractor interest is little better.

Structural Shapes and Reinforcing Bars

Demand for fabricated shapes is often insufficient to provide a test of the market, but weakness is prevalent in many sections. Reinforcing prices are improving and, though Indiana still is weak, the Chicago and St. Louis areas, Iowa, Kansas and Missouri are said to be much firmer. Much of the current reinforcing business is small industrial construction, but beginning next month and continuing through November, more large public jobs are expected.

. . .BOSTON. . .

. . . New England slowly recovering from catastrophe.

BOSTON, Sept. 27.—New England, which last week suffered a staggering blow, first by floods, then in rotation by a hurricane, tidal waves and renewed floods causing loss of lives numbering more than 700, rendering 100,000 homeless and loss of property approximating more than half a billion dollars, is slowly recovering from the shock and doing business. Practically all wholesale and jobbing stocks of axes, hatchets, heavy trimming tools, crosscut and other saws are exhausted. Much bridge, road construction and manufacturing plant repair work will be required.

Notwithstanding the catastrophe, pig iron sales the past week skyrocketed when compared with those of recent weeks, totaling more than 7000 tons, of which one furnace booked some 4000 tons including a 2500-ton order. Buying was based on the announcement of a $1 a ton advance in the price of iron. Sales unquestionably would have been larger had the telephone system not been so badly crippled. It will be several weeks before some foundries in the Connecticut Vally are able to resume operations under anything like normal conditions.

CANADA

. . . Low point in iron and steel output believed to be passed.

TORONTO, Sept. 27.—Production of pig iron and steel in August reached the lowest point for the year, but steel interests look for improvement for the remainder of the year. It is stated that a number of companies are getting plants in shape with the expectation that there will be substantial increase in orders for war materials. The regular betterment in domestic sales of iron and steel which usually crops up at this time of year is beginning to make its appearance and sales are moving up steadily, but so far no large awards have been reported. Local steel interests do not anticipate early changes in prices of either iron or steel materials.

Merchant pig iron sales continue to show improvement with sales for the week again marking a higher rate than the week immediately preceding. Producers have opened books for last quarter contracts and a number of melters have released inquiries and some have placed orders. Four blast furnaces are blowing. Current iron demand is largely in foundry grades and producers are taking care of demands from stock piles.

Betterment also is noted in iron and steel scrap.

. . . .BUFFALO. . . .

. . . Steel operations unchanged . . . Pig iron price increase in effect.

BUFFALO, Sept. 27—The new schedule of pig iron prices places No. 2 foundry at $21 and malleable at $21.50. There is some expectation of a rise in silvery iron, but as yet it has not taken effect. Though the results of the new schedule have not been pronounced, producers report orders noticeably stronger.

Mills are maintaining the same operating rates this week. Automotive business is slow in coming through but with more activity on the production lines anticipated shortly releases are expected to pick up. Bar business is only fair but the structural market is supported by numerous moderate orders.

A new Home for the Aged, costing $250,000, is to be erected at Hamburg, N. Y. Steel required will include 300 tons of shapes and 100 tons of reinforcing bars. Bids are due Oct. 4. Bids for a new school at Bolivar in Allegheny County are due Oct. 7.

Orders for Fabricated Steel Gain 18 Per Cent

NEW orders for fabricated structural steel in August totaled 102,539 tons, a gain of 17.6 per cent over the July figure, according to the American Institute of Steel Construction. New business in August, 1937, amounted to 124,879 tons. The aggregate of new orders booked in the present year through August amount to 679,793 tons, against 1,202,109 in a like period in 1937.

Shipments in August were 91,923 tons, as compared with 81,267 tons in July and 166,095 in August, 1937. The total for the eight months of the current year is 740,445 against 1,102,554 in a comparable period a year ago.

Ford 1939 Production To Start Oct. 3

DETROIT.—Ford Motor Co. will close down its Rouge plant production on Thursday and Friday of this week for a two-day inventory preceding the start of production on 1939 models, which is scheduled to begin Oct. 3, a Ford spokesman said. In addition, before this week is out, Ford probably will buy steel again in substantial quantity. It was also learned that the Ford use of cylinder bore liners (see "The Assembly Line" in this issue) is regarded as experimental at this stage, although it is known that extensive preparations are being made for actual adoption sometime soon.

Carnegie-Illinois Gives Plant to Morgantown, W. Va.

PITTSBURGH — Carnegie-Illinois Steel Corp.'s Sabraton Works, Morgantown, W. Va., an obsolete tin plate plant built in 1904 and abandoned in 1934, has been turned over to a non-profit corporation set up by the Morgantown Chamber of Commerce. Known as the Morgantown Community Association, Inc., the corporation will endeavor to bring new business to the town by offering use of the plant donated by Carnegie-Illinois.

. . . CLEVELAND . . .

. . . New business drops off . . . Ingot output up two points in Cleveland-Lorain area, steady at Youngstown . . . Aggregate orders have gained moderately over those of August.

CLEVELAND, Sept. 27.—Although incoming business has dropped off, ingot production this week for Youngstown and nearby cities is up two points to 45 per cent, with additional open hearth capacity active and bessemer operations stepped up. The Cleveland-Lorain rate is unchanged at 51 per cent.

The slump in orders, attributable to the war scare, the month-end slackness in automotive business and the disruption in New England, leaves the industry coasting along on momentum previously gained. Despite the recession, actual orders placed on producers' books so far this month are ahead of those of the corresponding August period. Construction continues to supply the biggest demand for steel.

There has been considerable speculation as to whether part of the advance in ingot production recently might not be due to mills building up their own stocks. Although few producers are willing to sink much money into inventories right now, excess production is difficult to avoid because orders are individually small and to fill one of them often requires a full heat.

On the consumer side, inventories continue slim.

The reaffirmation of bolt and nut prices by a leading producer in another district is expected to be followed here for fourth quarter on principal consumer quotations.

Pig Iron

The $1 advance in prices became generally effective Sept. 27. To the surprise of some producers, a number of larger melters welcomed the move, hoping to stop pressure for lower prices on castings. The amount of covering for iron between Sept. 20, when the first announcement was made, and Sept. 27 was only moderate and represented additions to coverage of July and August. Little realization on the advance can be hoped for by any producer during the balance of this year, but at least producers stand ultimately to get back part of the $4 reduction. At Youngstown it is said Republic probably will blow in its rebuilt and enlarged No. 3 blast furnace within the next week or 10 days.

Wire and Wire Products

Demand is heaviest for manufacturers' wire and rods. Merchant products have picked up a little recently, but the increase is below expectations, particularly in the Northwest. Prices remain spotty in a few areas. Export demand over the past few months has been principally from South America.

Bars, Plates and Shapes

Hot rolled bar and semi-finished orders are ahead of those of August by a slim margin. Activity is strong in the construction field and will be increasingly active in this vicinity over the next several months, since numerous bridge projects, school repair work and municipal utilities expansion is pending. Mount Vernon Bridge Co., Mount Vernon, Ohio, is reported to have been awarded the 1400 tons of structural for the west approach of the Main Street bridge, Cleveland. R. C. Mahon Co., Detroit, is reported to have been awarded the 700-ton Oberlin College auditorium.

Sheets and Strip

Orders actually placed on producers' books are heavier so far this month than in the comparable August period. During the past few days, however, incoming business has dropped off, and sellers look for a period of quiet until the October automotive specifications and releases are received.

Warehouse Business

Demand upon local warehouses is diversified and while some improvement has been shown this fall compared to summer months, aggregate business is around 35 per cent below one year ago at this time. Quotations are unchanged.

Tubular Goods

Orders this month are about even with those of August. Merchant pipe is reported holding up very well.

..GREAT BRITAIN..

. . . European markets affected by war fears . . . Cartel prices unchanged.

LONDON, Sept. 26 (*By Cable*).—The international crisis now governs all markets in Great Britain and on the Continent, and all pending improvement is jeopardized by war fears.

Cleveland producers recently sold good parcels of pig iron for overseas destinations. Stocks are still large, but depleted. War possibilities aside, steel makers are sustained more by hope than by real business. Rerollers are very slack and heavy works are wanting orders.

On the Continent the war crisis overweighs all other considerations, but business recently has improved with increased sales to the Argentine, Scandinavia, Holland, and Egypt.

The International Steel Cartel has decided to leave prices unchanged.

The tin plate market is active with buyers covering moderate quantities for delivery to March and over. Export sales are difficult and makers are quoting c.i.f. owing to the rapid rise in cost of war risk insurance.

New Zealand Government has bought 30 British locomotives, valued at £400,000.

At the annual meeting of the Indian Iron & Steel Co. the chairman said that the company's pig iron output for the rest of this year is fully sold at good prices, and that its position is more promising than three months earlier, but that it would be rash to forecast this year's result.

Trackwork Shipments in August Show Small Gain

SHIPMENTS of trackwork for tee rail track of 60 lb. per yard and heavier totaled 2838 net tons in August, as compared with 2242 tons in July and 7530 tons in August, 1937, according to the American Iron and Steel Institute. Shipments for 1938 through August totaled 25,058 tons against 69,700 in August, 1937.

....ST. LOUIS....

. . . Fairly heavy pig iron buying precedes $1 advance.

ST. LOUIS, Sept. 27.—The $1 a ton advance in the price of pig iron, which became effective today, resulted in a rush by melters to cover on their expected requirements for the remainder of the year. A fairly heavy tonnage was placed, but it did not compare with the amount purchased when the $4 a ton decline was put into effect on June 25, last. The melt of pig iron has not been up to expectations, and the purchases previously made are in many cases sufficient for the remainder of the fourth quarter. The advance was very much of a surprise to the trade. Shipments to the steel mills in the district have been disappointing in recent weeks, because of the desire of melters to hold down on their inventories. Steel makers catering to the railroads are completing orders on hand, and little new business is in prospect. Some of the stove manufacturers have stepped up their operations to five days a week, but the order files are not as heavy as they were at this time a year ago.

While inquiries for finished steel show some improvement, actual placing of orders is no better on the whole than it has been for several weeks past. Price announcements for fourth quarter have been reassuring, but consumers are still hesitant about buying for anything except jobs in hand. There has been some demand from jobbers for galvanized sheets and merchant bars. Structural demand is light.

Warehouse business is said to be about 10 per cent ahead of what it was at this time last month, but about 25 per cent below the volume for the corresponding period last year. September business has been mostly for bars, hot rolled sheets and plates.

Superior Structural Steel Co., St. Louis, has been awarded 250 tons of structural shapes for a warehouse at Scott Field, Belleville, Ill. Dickie Construction Co., St. Louis, is low bidder on the general contract for the Missouri Cancer Hospital at Columbia, requiring 260 tons of reinforcing bars, and Stiers Brothers Construction Co., St. Louis, is low bidder on a Government project at Dogtooth, Mo., involving 140 tons of reinforcing bars. Between 1200 and 1500 tons of reinforcing bars are involved in a number of projects pending, none of which is for more than 50 tons.

..SAN FRANCISCO..

. . . American Bridge Co. low on towers, requiring 18,500 tons of steel.

SAN FRANCISCO, Sept. 26.—American Bridge Co., Pittsburgh, was low bidder to Bonneville Administrator J. D. Ross on 1353 steel towers for the 246-mile transmission line to connect Bonneville and Grand Coulee Dams, and on 360 towers for a line from Bonneville to Vancouver, Wash.; approximately 15,000 tons of small shapes will be required for the former line, 3500 tons for the latter. On the Bonneville-Grand Coulee tower, the Bridge company bid $914,218, and on the Vancouver towers, $236,332. Only other bidder was Bethlehem Steel Co., which submitted bids of $951,743 and $249,370 on the respective lines.

National Tube Co. will supply 53 miles of 18-in. pipe for a natural gas line from Coalville, Utah, to Bigelow Hill, Wyo. The pipe line is a project of Mountain Fuel Supply Co., Salt Lake City.

Bids open tomorrow on the Tacoma, Wash., Narrows Bridge, which will require nearly 17,500 tons of steel.

Army and Navy construction has been a material factor in Pacific Coast steel demand during the past month, and probably will continue so for 90 days or longer. Two pending projects of this type, the Fleet Air Base at San Clemente Island, Cal., and a structural steel works foundry building at Mare Island, Cal., will require substantial but as yet unestimated quantities of shapes. Barracks buildings at western forts continue to take fair-sized reinforcing bar tonnages.

If a San Francisco bond election tomorrow results in the purchase of private lines by the Municipal Railway, the city will be in the market for more than 40 street cars and buses in the near future.

Many California steel men are planning to attend the convention of the Structural Engineers Association of California at Santa Barbara, Oct. 28 to 30.

..CAST IRON PIPE..

Vallejo, Cal., has awarded 3000 ft. of 20-in. and 1000 ft. of 14-in. pipe for Jamison Canyon pipe line to United States Pipe & Foundry Co., San Francisco, through contractor.

California State Architect has awarded Pacific Colony pipe line, Spadra, Cal., involving 24,560 ft. of 12-in. pipe, to Warren Southwest, Inc., Los Angeles; pipe was bought from United States Pipe & Foundry Co., San Francisco.

Knoxville, Tenn., plans extensions and improvements in pipe lines for water system, including plant additions and improvements. Cost about $1,000,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Blackstone, Va., asks bids until Oct. 4 for pipe lines for water system extensions, comprising about 1300 ft. of 4-in. for main supply lines and 6665 ft. of smaller size. Also for valves and fittings, hydrants and c.i. specials. DeMott & Ryan, Law Building, Lynchburg, Va., are consulting engineers. C. H. Hardy is town manager.

Rock Island, Ill., plans pipe lines for extensions in water systems. Also 500,000-gal. elevated steel tank and tower, and new reservoir. Cost about $500,000, of which $231,750 will be a Federal grant. Federal Engineering Co., Central Office Building, Davenport, Iowa, is consulting engineer.

Grand Forks, N. D., plans pipe lines for extensions and replacements in water system; also for expansion in filtration plant, new pumping station and other waterworks installation. Cost about $272,000. Financing is being arranged through bond issue of $150,000 and Federal grant, $122,400. A. F. Hulteng is city engineer.

Indio, Cal., plans pipe lines for water system and other waterworks installation. Cost about $92,000, of which $50,000 will be a bond issue and $42,000 a Federal grant.

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., Col. T. A. Leisen, secretary, plans pipe lines for water system in districts Nos. 1555, 1556 and 1557, recently created.

Temple, Tex., plans pipe lines for extensions and improvements in water system, including about six miles of 18-in. for main supply lines. Also for 1,000,000-gal. elevated steel tank and tower and other waterworks installation. Fund of $500,000 is being arranged for this and sewer system, of which $275,000 will be a bond issue and $225,000 a Federal grant. Koch & Fowler, Great National Life Building, Dallas, Tex., are consulting engineers.

Fayette, Mo., plans about 18,000 ft., various sizes, for extensions and replacements in water system. Fund of $95,000 is being arranged for this and other waterworks installation.

Rome, Ga., plans pipe lines for extensions in water system and other waterworks installation. Fund of $132,000 has been arranged through Federal aid for this and extensions in sewer system.

Denton, N. C., asks bids until Oct. 3 for 12,000 ft. of 8, 6 and 4-in., Class B, c.i. pipe, and 14,500 ft. of 2 and 1½-in. galvanized steel pipe for water system. Also for 100,000-gal. elevated steel tank and tower, deep-well pumping station and other waterworks installation. William F. Freeman, High Point, N. C., is consulting engineer.

Sanford, Me., will shortly be in the market for pipe, etc., for water system improvements to cost $35,000. The board of selectmen is handling the project.

. . PHILADELPHIA . .

. . . Pig iron bookings gain moderately as buyers cover before price advance . . . Steel sales unaffected by fourth quarter price announcement . . . Scrap prices remain unchanged.

PHILADELPHIA, Sept. 27.—The rate of incoming business here continues to show a moderate week-to-week expansion, but the degree of each week's improvement, when contrasted with the preceding week, is growing progressively smaller. However, total bookings in September will undoubtedly show a small gain over August when converted to a daily average.

The bulk of the district's support continues to come from miscellaneous sources, with only sporadic assistance derived from automobile parts makers and the shipyards. Commitments by the former while gradually growing in size are still in disappointing volume.

Although the political situation abroad has not as yet had any direct effect on steel consuming industries here, it has acted to discourage long term planning by confusing the future picture. This influence has found reflection in the accentuated hand-to-mouth buying policy that characterizes the bulk of current purchases.

The reaffirmation of present prices on fourth quarter steel business has had no effect on the rate of incoming business as it was in line with general expectations. The increase in pig iron quotations has brought out some fourth quarter contracting, but the tonnage involved is not large.

Steel ingot production for the current week is estimated at 30 per cent of capacity, a gain of two points over the previous week. At this rate operations are gaged fairly closely to new business and stocking of unfinished material is negligible.

Both buyers and sellers continue to mark time in the scrap market and prices remain unchanged. Dealers' attitude toward higher prices in the future may be described as hopeful rather than expectant.

Pig Iron

Announcement by several producers of an advance of $1 in prices effective Sept. 27 has developed a modest amount of fourth quarter contracting. Most of this iron, however, would have been bought regardless of price changes and the only effect of the advance was to hasten the placing of the business. Most foundries here are fairly well stocked and in view of the uncertainties of the future are not disposed to buy very far ahead. Shipments to stove makers and jobbing foundries have been improving lately, but in the aggregate these shipments are not very heavy.

Plates and Shapes

Miscellaneous buying continues to be the chief support of the plate market as the major consumers grow more conspicuous by their absence. The Pennsylvania Railroad has bought all the material it will need to complete its 1000-car program and no other railroad buying is in sight. The shipyards, while still the district's most active plate users, have contracted for practically all the plates that will be needed to construct the ships that are on the books at present and the trade does not look for any further buying of any size from this source for some time. Plate prices are firm in most cases, but shading of from $1 to $2 a ton has cropped up occasionally. Structural shape awards in the past week, while numerically the heaviest in some time, did not involve a particularly heavy tonnage. The local public construction program is gradually gaining momentum and awards in the next few months are expected to show a substantial improvement over the present volume. One of the largest jobs pending is a city court house which will take an estimated 2000 tons of shapes.

Sheets and Strip

Small tonnages and prompt shipments continue to characterize current sales. Shipments to automotive interests are slowly gaining in volume, while heater and radio makers, experiencing a seasonal improvement in business, are accounting for moderate tonnages. Sheet mill rolling schedules for the present week have been reduced by more than one producer owing to the growing size of mill stocks. Morris Wheeler & Co. were low on recent bids on 1000 tons of 25-gage sheets for automobile license plates.

Reinforcing Bars

Although there is a fairly large quantity of small orders on sellers' books, the dearth of large reinforcing bar projects is keeping total bookings at a very low level. The only award over 100 tons in the past week was for an addition to a school at Yeadon, Pa.

. . . . PIPE LINES . . . .

Mountain Fuel Supply Co., Salt Lake City, Utah, has awarded 53 miles of 18-in. welded steel pipe to National Tube Co., Pittsburgh, for natural gas pipe line between Coalville, Utah, and Bigelow Hill, Wyo.; hauling, stringing, welding, ditching, laying and coating will be done by S. D. Bechtel Co., 155 Sansome St., San Francisco.

Board of Water Commissioners, Denver, Colo., has announced that Lock Joint Pipe Co., Denver, is low bidder for reconstruction of Conduit No. 3 on South Federal Boulevard involving 26,330 ft. of 30-in. I.D. pipe.

Sacramento, Cal., opens bids Sept. 30 on Sections 6 and 7 of water distribution system requiring 7910 ft. of 30-in. pipe.

General Purchasing Officer, Panama Canal, Washington, D. C., asks bids Sept. 30 on 68,000 ft. galvanized welded steel pipe and 6000 ft. of welded steel pipe (Schedule 3384).

Simrall Pipe Line Corp., Mount Pleasant, Mich., affiliated with Standard Oil Co. of Ohio, Midland Building, Cleveland, plans new welded steel pipe line from recently opened oil field area in Freeman-Redding district, Clare County, Mich., to Mount Pleasant, about 25 miles, for crude oil transmission. New line will connect with main pumping station of company at last noted point.

Continental Oil Co., 60 East Forty-second Street, New York, and Ponca City, Okla., has let contracts to Osage Construction Co., Tulsa, Okla., and Fredell Construction Co., Houston, Tex., for 4 and 6-in. welded steel pipe lines from oil field area at Lance Creek, Wyo., to Glenrock, Wyo., 65 miles, for crude oil transmission to company oil refinery at last noted point. Osage company will build 50 miles of 4-in., connecting with 15 miles of 6-in. to be constructed by Fredell company from Glenrock terminus.

United States Engineer Office, Charleston, S. C., closes bids Oct. 5 for 100 lengths of electric lap-welded steel shore discharge pipe, each length 16 ft. (Circular 31).

Stockdale, Tex., is arranging bond issue of $39,000, to which will be added Federal loan of $21,500 and grant of $17,590 for pipe line system for gas distribution, including main welded steel pipe line for natural gas supply to municipality. J. W. Beretta Engineers, Inc., National Bank of Commerce Building, San Antonio, Tex., is consulting engineer.

National Sodium Products, Ltd., Calgary, Alta., plans new welded steel pipe line from oil field area near Moose Jaw, Sask., to Bishopric, Sask., about 25 miles, for crude oil transmission to bulk storage and distributing terminal to be built at latter point. Cost over $250,000.

La Cie d'Approvisionement d'Eau, Ltd., Cap St. Ignace, Que., plans quantity of steel pipe for main feeder lines in connection with extensions and improvements in water system and plant.

Sandusky, Ohio, will take new bids Sept. 28 on 1000 tons of 42-in. steel pipe for a water intake. Initial bids exceeded estimate.

. . . .NEW YORK. . . .

. . . September volume of steel orders gains moderately over that of August . . . No new railroad buying stimulated . . . Tin plate still in doldrums.

NEW YORK, Sept. 27.—Orders booked in the New York district during September by most of the steel companies run from a shade better to quite substantially above those taken in August. There has been no pronounced upward trend during the past two or three weeks, but, on the other hand, there has been no decline. In other words, business is just a little better than holding its own.

Developments of the past week in the price situation have made no material difference except in pig iron, the advance of $1 a ton in that commodity having resulted in a fair volume of protective contract coverage. Other than the New York Central, whose rail and track material requirements were known before the reduction in prices of track material, no Eastern railroad has entered the market for such supplies. The critical phase of the railroad wage situation probably will results in deferment of all but the most necessary purchases.

While the war scare undoubtedly has intensified the caution that has long existed among buyers, there are few, if any instances, of delayed buying that can be directly attributed to that situation. The most probable effect is to increase the amount of hand-to-mouth buying.

The extension of tin plate prices into the fourth quarter has not changed the business situation in that product one iota. Consumers are not buying with any confidence. In all probability they will continue to follow this course until the price for the contract period, Jan. 1 to Sept. 30, 1939, is finally announced.

Pig Iron

Practically all sellers in this market had raised prices $1 by Monday or Tuesday, but it is quite apparent that most buyers had ample advance warning to cover on their fourth-quarter requirements at the previous levels. Thousands of tons of iron were booked during the previous week, and as a result little if any new business is looked for until well into the last quarter. Practically the only foundries not to be heard from were those in Connecticut and other nearby New England points where communications have been hampered ever since the tropical hurricane struck last Wednesday. Probably the most encouraging aspect of the present situation is that foundry melt is on the increase and each month continues to show an improvement in tons shipped over the preceding month. September should be no exception, when the final tallies are in.

Reinforcing Bars

The trucking strike in progress here and the sympathy strike of New Jersey truck drivers announced yesterday has caused a cessation of practically all bar movements to projects in Queens, Brooklyn, New York and Northern New Jersey. Unless a settlement is reached soon, work on a number of projects in these areas will be seriously hampered by lack of supplies. Although the strike will have an adverse affect on September's shipments, the month's new business has shown a noticeable improvement over August, especially in the less-than-100-tons category. Highway mesh requirements are in slightly heavier demand, particularly in New York State, where approximately 1300 tons will be bid on shortly. Prices are still on the soft side as evidenced by recent bidding on lots ranging from 20 to 40 tons for the Treasury Department which were taken at 2.17c., truck delivery New York.

Plates and Sheets

The present plate market is without feature, and district sales offices show little enthusiasm as to the future. Orders are in small lots and only for current requirements.

Sheet volume is being maintained and by month end will probably show some increase over that of August, though small percentage wise. The refrigerator business has yet to reach its anticipated fall activity, and increase of production schedules in this direction is expected to add to the present miscellaneous demand considerably. Meanwhile, stove makers continue to specify freely. New jobber business is small as stocks are being reduced through the use of bargain prices.

. . .CINCINNATI. . .

. . . Ingot output lower . . . Pig iron up $1 . . . Foundries cover needs.

CINCINNATI, Sept. 27.—Opening of books for fourth quarter sheet requirements has brought no rush of district users to cover. Current business consists of small quantity orders, largely for rush shipments. While there has been a definite increase in automobile demand in the past few weeks, this is still far below anticipated levels. Miscellaneous demand continues to hold to recent levels. Rolling schedules are sustained at about 50 per cent of mill capacity. A favorable factor is the high rate of demand for galvanized sheets, particularly from Western and Southwestern sources.

Ingot production in this area has dropped to 36 per cent. One district mill, heretofore running five open hearths, shut down the entire group to allow finished production to catch up with ingot output.

Price advances of $1 on pig iron by both Northern and Southern producers, which became effective on Tuesday, brought a hurried rush of melters to cover. No. 2 foundry iron is now quoted at Cincinnati at $21.06 for Southern and $21.44 for Northern.

RAILROAD BUYING

Illinois Central has placed an order for 1000 box cars with American Car & Foundry Co.

Wheeling & Lake Erie has purchased 5 locomotives on the 2-8-4 type from American Locomotive Co.

Nevada Consolidated Copper Corp. is taking bids on from 15 to 20 dump cars.

Southern has placed an order for four diesel-electric passenger trains with St. Louis Car Co. Fairbanks, Morse & Co. will construct the driving equipment.

. . .NON-FERROUS. . .

. . . European political situation continues to dominate the non-ferrous markets . . . Bookings here decline in the week, but prices are firm and unchanged.

NEW YORK, Sept. 27.—Movements in the non-ferrous market in the past week continued to reflect day-to-day developments in the foreign political crisis. In Europe, private buyers have retreated from the market pending clarification of the German-Czech situation and armament purchases have been the chief support of the market. In the United States this tension caused many buyers to reappraise the possible future movements of prices and sellers experienced a not unexpected slackening in bookings. Developments abroad have overshadowed recognition of the fact that domestic consumption continues to show small but consistent gains. Copper bookings by sellers here totaled about 12,000 tons in the past week as compared with close to 37,000 tons in the previous week. The present price of 10.375c. per lb., delivered Connecticut Valley, is well maintained, outside offerings at slightly less not having attracted a great deal of attention. Sales by the cartel group are holding up well, though a little below the average of the preceding week. Second session prices in London today developed a downward trend, with the consequence that around 10.25c., c.i.f., usual ports, ruled on late foreign sales today.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 21	Sept. 22	Sept. 23	Sept. 24	Sept. 26	Sept. 27
Electrolytic copper, Conn.*	10.375	10.375	10.375	10.375	10.375	10.375
Lake copper, N. Y.	10.50	10.50	10.50	10.50	10.50	10.50
Straits tin, spot, New York	43.65	43.40	43.25	....	43.75	44.00
Zinc, East St. Louis	4.95	4.95	4.95	4.95	4.95	4.95
Zinc, New York	5.34	5.34	5.34	5.34	5.34	5.34
Lead, St. Louis	4.95	4.95	4.95	4.95	4.95	4.95
Lead, New York	5.10	5.10	5.10	5.10	5.10	5.10

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.00c. a lb., prompt, f.o.b., New York.
Antimony, American, 11.25c. per lb., prompt shipment, New York.
Quicksilver, $76.00 to $78.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 11.00c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	45.00c. to 46.00c.
Tin, bar	47.00c. to 48.00c.
Copper, Lake	12.00c. to 12.50c.
Copper, electrolytic	11.25c. to 12.25c.
Copper, castings	10.75c. to 12.75c.
*Copper sheets, hot-rolled	18.375c.
*High brass sheets	16.75c.
*Seamless brass tubes	19.50c.
*Seamless copper tubes	18.875c.
*Brass rod	12.625c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.50c.
Lead, American pig	5.75c. to 6.75c.
Lead, bar	6.50c. to 6.875c.
Lead, sheets, cut	7.75c.
Antimony, Asiatic	15.00c. to 16.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	29.25c. to 30.25c.
Babbitt metal, commercial grade	20.25c. to 50.25c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits, pig	47.375c.
Tin, bar	49.375c.
Copper, Lake	11.375c. to 11.625c.
Copper, electrolytic	11.375c. to 11.625c.
Copper, castings	11.175c.
Zinc, slabs	7.50c. to 7.75c.
Lead, American pig	5.60c. to 5.85c.
Lead, bar	8.75c.
Antimony, Asiatic	17.75c. to 18.00c.
Babbitt metal, medium grade	21.25c.
Babbitt metal, high grade	51.375c.
Solder, ½ and ½	28.50c.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.25c.	9.00c.
Copper, hvy. and wire	7.25c.	7.75c.
Copper, light and bottoms	6.50c.	6.75c.
Brass, heavy	4.375c.	4.875c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.875c.	8.375c.
No. 1 yel. brass turnings	4.25c.	4.75c.
No. 1 red brass or compos. turnings	6.375c.	6.875c.
Lead, heavy	3.50c.	3.875c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.25c.	12.75c.
Zinc	2.125c.	3.375c.

Tin

Anxiety over the possible effects of a war on shipments brought out a liberal amount of business in the past week at prices that were more affected by declines in the Sterling rate than by market conditions. Buyers' preferences, which were for futures on Thursday and Friday, changed to nearby positions yesterday and today. Offerings are not too plentiful as the climbing war risk insurance continues to restrain sellers' activities. Despite an increasing volume of business, prices in London are little changed from a week ago.

Zinc

Following several weeks of fairly heavy buying, demand for spelter in the past week was in noticeably less volume. The week's sales, totaling 4403 tons of prime Western, were less than 1/3 the previous week's volume. Shipments, at 3100 tons, were also lower, but were taken by the trade to indicate that consumption was progressing at a good rate. Prices here were unchanged all week at 5.34c. per lb., New York, while today's late London price of 3.08c. per lb., was two points below the price of a week ago.

Lead

The heavy buying of the past several weeks has apparently provided lead users with all their September requirements and with about 80 per cent of their October needs and the slackening of sales experienced in the week just past was not surprising. Occasional October carlots provided the bulk of the week's activities at quotations that remained unaltered at 5.10c. per lb., New York. The London market has been quite active all week, but a mild reaction set in on second call today, bringing prices down to around 3.25c. per lb.

Brass and Bronze Ingots

Average prices received by members of the Non-Ferrous Ingot Metal Institute during the 28-day period ended Sept. 2, on 80-10-10 and 85-5-5-5 per cent metal, were 12.331c. and 10.618c. per lb. respectively. These compare with 11.94c. and 10.301c. in the preceding period.

IRON AND STEEL SCRAP

. . . Scrap trading has practically ceased, pending developments abroad . . . Composite unchanged at $14.25.

SEPT. 27.—Buyers and sellers are both marking time pending the solution of the crisis in Europe. If war comes, the export market is bound to be completely disrupted for months and the immediate reaction on prices will be downward, according to the opinion of those most concerned. Meanwhile some domestic markets seem stronger, and others weaker, but only in tone, and there have been hardly any price changes of any consequence throughout the country. The only sale reported in the past week was 8000 tons of Nos. 1 and 2 at St. Louis, at prevailing market prices. Railroad heavy melting steel is somewhat softer at Pittsburgh, but with No. 1 heavy melting unchanged in all districts, THE IRON AGE composite remains at $14.25, following a decline of 17c. last week.

Pittsburgh

The market is no stronger than a week ago, with buyers and sellers alike marking time pending further European developments. Recent war scares have injected a note of jitteryness into the scrap market. Some brokers continue to pay $15 a ton for No. 1 heavy melting and small sales into consumption have been made within the quoted range, which is unchanged this week. Railroad heavy melting is off 25c. a ton to $15.75 to $16.25 on the basis of recent sales and offers.

Chicago

Prices are unchanged and no mills are in the market. Trading is exceedingly quiet as attention is focused on the European crisis. A sale to Japan of from 30,000 to 40,000 tons of heavy melting has been reported on the West Coast. Several brokers are believed to have shared in the business.

Philadelphia

Material is moving into domestic consumption on old orders in spotty volume and the price structure here would probably be undergoing some slight reaction if it were not for the entrance of strong buying action on the part of several exporters. Material is accumulating both at yards and at Port Richmond for loading in a week or so, the prices offered to dealers being in the neighborhood of $13.50 for No. 1 and $12.50 for No. 2, other offers at a higher level being available for desirable lots. Some new orders for breakable cast were booked during the week at an unchanged price level.

Youngstown

Small sales of some of the cheaper grades have been made in the Valley recently, at prices comparable to present published quotations. Prices are without any change this week. Smaller dealers are holding on to their material with increasing firmness.

Cleveland

War talk has increased the determination of some dealers to refrain from selling at this time if possible. Scrap being moved is going out of town, with the activity at Pittsburgh serving to hold prices here unchanged.

Buffalo

The scrap market as yet has shown no definite indication of weakening, regardless of the fact that no sales have been reported. That the market was somewhat disordered was said by some to have been caused by the European crisis which is held chiefly responsible for the hesitancy on the part of buyers.

St. Louis

An East Side melter bought 8000 tons of Nos. 1 and 2 heavy melting steel at the prevailing market for delivery over the next 60 days. It is understood that other steel mills expect to re-enter the market soon, from which it may be gathered that the European situation has not halted buying. Cast iron borings and turnings are down 25c. a ton, and steel angle bars, in which there has been a slackening of demand from the foundries, are 50c. a ton down from last week's prices.

Cincinnati

The scrap market is definitely soft and quiet with dealers largely discussing the European situation and trying to guess its effect upon their business. Mill interest in substantial coverage is lacking and dealers are making a few transactions wherever advantageous opportunity presents itself or need for contract application arises. Prices are unchanged and on the whole, the undertone is weak.

Detroit

During the current week, sale of October scrap production from automotive plants is scheduled. Lists on hand near the middle of the week indicated that tonnages would be somewhat lighter than was expected in some quarters which earlier had feared that the market would be unable to absorb a heavy production. There is every indication that prices are being sustained except possibly on blast furnace items.

New York

With the crisis in Europe leaving the whole export business in danger of sudden collapse, and with all yard activity suspended on Monday and Tuesday because of religious holidays, buying activity slowed up to a trickle this week and prices remain unchanged from last week. Should a general war break out abroad, the last orders from Italy and Germany obviously would be worthless, and the whole export market would be disrupted for months. Hence leading brokers are marking time at present and watching developments. Shipments into eastern Pennsylvania are light and consist principally of heavy breakable cast, but there is no change in this item pricewise.

Boston

With some 250,000 miles of telephone wires down and telegraph companies unable to handle most business offered them as a result of last week's hurricane and floods, the scrap trade's hands were tied; consequently little business was transacted. Quotations were nominal and unchanged. It is assumed that conditions this week will be improved and that business can resume, although on a restricted scale. Actual yard losses were very slight. Loading of scrap at Providence for export has been resumed, following the hurricane, and loadings at this port are scheduled as soon as railroads can properly handle carlots. The accumualtion of freight west of the Connecticut River is bound to have its effect on the movement of scrap for the next few days.

. . BIRMINGHAM . .

. . . Southern pig iron $1 higher . . . Steel buying at fair rate.

BIRMINGHAM, Sept. 27—Fourth quarter steel prices in the Birmingham market are in line with those of the other districts. As in other markets, the most important change was in steel rails, with a reduction of $2.50 a ton. The new price for standard steel rails is $40, effective Sept. 20, for shipments up to and including Dec. 31.

There is a fair run of new steel and pig iron tonnage, and operations are being maintained at steady rates. Last week 12 and 13 open hearths were active; this week 12 are scheduled. Blast furnace production is unchanged, with 14 active stacks.

A $1 advance in pig iron has become effective as of Sept. 27.

Metal & Thermit Corp., New York, has appointed the following supply houses as distributers of its Murex line of electrodes: V. B. Anderson Co., Los Angeles; Chicago Tube & Iron Co., Chicago; Farquhar Machinery Co., Jacksonville, Fla.; Fulton Supply Co., Atlanta; Grammer, Dempsey & Hudson, Newark, N. J.; Grand Rapids Supply Co., Grand Rapids, Mich.; Albert W. Roth, Kansas City, Mo.; Standard Supply & Hardware Co., New Orleans; and Welders Supply Co., Houston, Texas.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$15.00 to $15.50
Railroad hvy. mltng.	15.75 to 16.25
No. 2 hvy. mltng. steel	13.75 to 14.25
Scrap rails	16.50 to 17.00
Rails 3 ft. and under	17.00 to 17.50
Comp. sheet steel	15.00 to 15.50
Hand bundled sheets	14.00 to 14.50
Hvy. steel axle turn.	13.50 to 14.00
Machine shop turn.	9.50 to 10.00
Short shov. turn.	9.50 to 10.00
Mixed bor. & turn.	8.25 to 8.75
Cast iron borings	8.25 to 8.75
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	15.25 to 15.75
RR. knuckles & cplrs.	17.00 to 17.50
Rail coil & leaf springs	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Low phos. billet crops	17.50 to 18.00
Low phos. punchings	16.00 to 16.50
Low phos. plate	16.00 to 16.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	12.50 to 13.00
Hydraulic bund., new	14.00 to 14.50
Hydraulic bund., old	11.00 to 11.50
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels	16.50 to 17.00
Hvy. breakable cast	16.00 to 16.50
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.50 to 16.00
Machine shop turn.	8.00 to 8.50
No. 1 blast furnace	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings	10.00 to 10.50
No. 1 low phos. hvy.	16.50 to 17.00
Couplers & knuckles	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Steel axles	21.50 to 22.00
Shafting	19.50 to 20.00
No. 1 RR. wrought	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	10.50 to 11.00
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$13.00 to $13.50
Auto. hvy. mltng. steel alloy free	11.50 to 12.00
No. 2 auto. steel	11.00 to 11.50
Shoveling steel	13.00 to 13.50
Factory bundles	12.00 to 12.50
Dealers' bundles	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling, old	4.75 to 5.25
Rolled carwheels	15.50 to 16.00
Railroad tires, cut	16.00 to 16.50
Railroad leaf springs	16.00 to 16.50
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	12.00 to 12.50
Coil springs	16.50 to 17.00
Axle turn. (elec.)	12.50 to 13.00
Low phos. punchings	16.00 to 16.50
Low phos. plates 12 in. and under	16.00 to 16.50
Cast iron borings	6.00 to 6.50
Short shov. turn.	7.00 to 7.50
Machine shop turn.	6.00 to 6.50
Rerolling rails	17.50 to 18.00
Steel rails under 3 ft.	16.00 to 16.50
Steel rails under 2 ft.	16.50 to 17.00
Angle bars, steel	15.50 to 16.00
Cast iron carwheels	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Agric. malleable	10.50 to 11.00
	Per Net Ton
Iron car axles	18.50 to 19.00
Steel car axles	19.00 to 19.50
Locomotive tires	16.00 to 16.50
Pipes and flues	9.00 to 9.50
No. 1 machinery cast	12.50 to 13.00
Clean auto. cast	12.00 to 12.50
No. 1 railroad cast	11.50 to 12.00
No. 1 agric. cast	11.00 to 11.50
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50
Brake shoes	10.00 to 10.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	13.00 to 13.50
Low phos. plate	14.50 to 15.00
No. 1 busheling	13.00 to 13.50
Hydraulic bundles	13.00 to 13.50
Machine shop turn.	9.50 to 10.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel	11.50 to 12.00
Comp. sheet steel	12.00 to 12.50
Light bund. stampings	9.00 to 9.50
Drop forge flashings	10.00 to 10.50
Machine shop turn.	7.00 to 7.50
Short shov. turn.	7.50 to 8.00
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet and bloom crops	17.00 to 17.50
Cast iron borings	7.75 to 8.25
Mixed bor. & turn.	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	18.50 to 19.00
Rails for rolling	17.00 to 17.50
Railroad malleable	15.00 to 15.50
Cast iron carwheels	14.00 to 14.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. bndled sheets	12.00 to 12.50
Old hydraul. bundles	10.50 to 11.00
Drop forge flashings	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings	10.50 to 11.00
Machine shop turn.	6.75 to 7.25
Knuckles & couplers	16.50 to 17.00
Coil & leaf springs	16.50 to 17.00
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	15.50 to 16.00
Shov. turnings	6.75 to 7.25
Mixed bor. & turn.	6.75 to 7.25
Cast iron borings	6.50 to 7.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast	15.50 to 16.00
No. 1 cupola cast	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	17.50 to 18.00
Cast iron carwheels	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Chemical borings	8.50 to 9.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$12.50 to $13.00
No. 1 hvy. melting	12.50 to 13.00
No. 2 hvy. melting	12.00 to 12.50
No. 1 locomotive tires	14.00 to 14.50
Misc. stand. sec. rails	14.00 to 14.50
Railroad springs	15.00 to 15.50
Bundled sheets	8.00 to 8.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.	4.50 to 5.00
Machine shop turn.	5.00 to 5.50
Heavy turnings	9.00 to 9.50
Rails for rolling	16.50 to 17.00
Steel car axles	18.50 to 19.00
No. 1 RR. wrought	10.75 to 11.25
No. 2 RR. wrought	12.50 to 13.00
Steel rails under 3 ft.	15.50 to 16.00
Steel angle bars	14.50 to 15.00
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	14.00 to 14.50
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	11.00 to 11.50
Stove plate	10.00 to 10.50
Grate bars	8.50 to 9.00
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel	$11.25 to $11.75
No. 2 hvy. mltng. steel	9.00 to 9.75
Scrap rails for mltng.	15.25 to 15.75
Loose sheet clippings	6.75 to 7.25
Hydrau. b'ndled sheets	10.25 to 10.75
Cast iron borings	3.25 to 3.75
Machine shop turn.	4.50 to 5.00
No. 1 busheling	8.00 to 8.50
No. 2 busheling	2.75 to 3.25
Rails for rolling	17.25 to 17.75
No. 1 locomotive tires	14.00 to 14.50
Short rails	17.75 to 18.25
Cast iron carwheels	12.50 to 13.00
No. 1 machinery cast	12.00 to 12.50
No. 1 railroad cast	11.00 to 11.50
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricul. malleable	11.50 to 12.00
Railroad malleable	14.00 to 14.50
Mixed hvy. cast.	9.50 to 10.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$12.50 to $14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	.... 10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	.... 14.50
Tramcar wheels	.... 14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$10.00 to $10.50
No. 2 hvy. mltng. steel	8.50 to 9.00
Borings and turnings	6.00 to 6.50
Long turnings	6.00 to 6.50
Short shov. turnings	7.00 to 7.50
No. 1 machinery cast	11.50 to 12.00
Automotive cast	12.50 to 13.00
Hvy. breakable cast	9.00 to 9.50
Hydraul comp. sheets	12.00 to 12.50
Stove plate	8.00 to 8.50
New factory bushel	11.00 to 11.50
Old No. 2 busheling	3.00 to 3.50
Sheet clippings	8.50 to 9.00
Flashings	9.00 to 9.50
Low phos. plate scrap	11.50 to 12.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$10.00 to $10.50
No. 2 hvy. mltng. steel	8.50 to 9.00
Hvy. breakable cast	11.50 to 12.00
No. 1 machinery cast	12.00 to 12.50
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought	11.00 to 11.50
No. 1 wrought long	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*	3.50 to 4.00
Cast borings*	3.00 to 3.50
No. 1 blast furnace	3.00 to 3.50
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	5.00 to 5.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	$13.50 to $14.00
No. 2 cast†	10.50 to 11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	$10.25 to $10.75
Machine shop turn.	$3.38 to 4.50
Mixed bor. & turn.	2.00 to 2.25
Bun. skeleton long	7.50 to 7.75
Shafting	14.00 to 14.50
Cast bor. chemical	5.50 to 5.75
Per gross ton delivered consumers' yards:	
Textile cast	$14.50 to $15.00
No. 1 machine cast	14.00 to 14.50

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel	11.50 to 12.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel	$9.50	$9.00
No. 2 hvy. mltng. steel	8.00	7.50
Mixed dealers steel	7.00	6.50
Scrap pipe	5.50	5.00
Steel turnings	4.50	4.00
Cast borings	3.50	3.00
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	$11.00 to $11.50
No. 2 hvy. mltng. steel	9.50 to 10.00
No. 2 cast	10.00 to 11.00
Stove plate	9.00 to 10.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel	11.50 to 12.00
Rails (scrap)	12.50 to 13.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	Nominal

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.25c.
Detroit, delivered	2.35c.
Duluth	2.35c.
Philadelphia delivered	2.57c.
New York	2.59c.
On cars dock Gulf ports	2.60c.
On cars dock Pacific ports	2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c. to 2.05c.
Detroit, delivered	2.00c. to 2.15c.
On cars dock Tex. Gulf ports	2.25c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.75c. to 1.90c.
Detroit, delivered	1.85c. to 2.00c.
On cars dock Tex. Gulf ports	2.10c. to 2.25c.
On cars dock Pacific ports	2.35c.

The above range in prices covers generally the spread between large and small jobs.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.
Philadelphia, del'd	2.15c.
New York, del'd	2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P't'g	3.80c.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

PRICES F.O.B. UNLESS OTHERWISE NOTED

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown or Middletown	2.15c.
Detroit, delivered	2.25c.
Philadelphia, delivered	2.32c.
Granite City	2.25c.
On cars dock Pacific ports	2.65c.
Wrought iron, Pittsburgh	4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland or Middletown	3.20c.
Detroit, delivered	3.30c.
Granite City	3.30c.
Philadelphia, delivered	3.52c.
On cars dock Pacific ports	3.80c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron, Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	4.95c.
Special Dynamo	5.65c.
Transformer	6.15c.
Transformer Special	7.15c.
Transformer Extra Special	7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.95c.
F.o.b. cars dock Pacific ports	4.65c.

Vitreous Enameling Stock, 20 Gage

Pittsburgh,, Gary Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

Black Plate

Pittsburgh	3.15c.
Gary	3.15c.
Granite City	3.25c.
On cars dock Pacific ports, boxed	4.10c.

NOTE: No. 29 gage is heaviest in which tin mill black plate is sold, No. 28 and heavier taking sheet base. There are no gages which take the above base prices as extras are applicable in all cases.

Tin Plate

	Per Base Box
Standard cokes, Pittsburgh and Gary	$5.35
Standard cokes, Granite City	5.45

Special Coated Manufacturing Ternes

	Per Base Box
Pittsburgh	$4.65
Gary	4.65
Granite City	4.75

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

HOT ROLLED STRIP

Prices F.o.b. Unless Otherwise Noted

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.15c.
Detroit, delivered	2.25c.

Cooperage Stock

Pittsburgh & Chicago	2.25c.

COLD ROLLED STRIP*

	Base per Lb
Pittsburgh, Youngstown or Cleveland	2.95c.
Chicago	3.05c.
Detroit, delivered	3.05c.
Worcester	3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown or Cleveland	3.10c.
Detroit, delivered	3.20c.
Worcester	3.50c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.95c.	3.15c.
Carbon	.51- .75	4.30c.	4.50c.
Carbon	.76-1.00	6.15c.	6.35c.
Carbon	1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

*On galvanized wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Barbed wire, galvanized	3.20
Twisted barbless wire	3.20
Woven wire fence, base column.	67
Single loop bale ties, base col...	56

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	56	36	¼ & ⅜	.+ 9	+30
¼ to ⅜	..59	43½	½	24	6½
½	....63½	54	¾	30	13
¾	....66½	58	1 & 1¼	..34	19
1 to 3	..68½	60½	1½	38	21½
			2	....37½	21

Lap Weld

2	61	52½	2	....30½	15
2½ & 3	..64	55½	2½ to 3½	31½	17½
3½ to 6	..66	57½	4	....33½	21
7 & 8	..65	55½	4½ to 8	.32½	20
9 & 10	..64½	55	9 to 12	..28½	15
11 & 12	..63½	54			

Butt Weld, extra strong, plain ends

⅛	....54½	41½	¼ & ⅜	.+10	+43
½ to ⅝	..56½	45½	½	25	9
½	....61½	53½	¾	31	15
¾	....65½	57½	1 to 2	...38	22½
1 to 3	...67	60			

Lap Weld, extra strong, plain ends

2	59	51½	2	....33½	18½
2½ & 3	63	55½	2½ to 4.39		25½
3½ to 6	61½	59	4½ to 6.37½		24
7 & 8	..65½	56	7 & 8	..38½	24½
9 & 10	..64½	55	9 to 12	..32	20½
11 & 12	..63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 3 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d....13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d...13 B.W.G.	10.67	9.26	....
1½ in. o.d...13 B.W.G.	11.79	10.23	9.72
1¾ in. o.d...13 B.W.G.	13.42	11.64	11.06
2 in. o.d....13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d...13 B.W.G.	16.76	14.54	13.79
2½ in. o.d...12 B.W.G.	18.45	16.01	15.16
2¾ in. o.d...12 B.W.G.	20.21	17.54	16.58
2⅞ in. o.d...12 B.W.G.	21.42	18.59	17.54
3 in. o.d....12 B.W.G.	22.48	19.50	18.35
3½ in. o.d...11 B.W.G.	28.37	24.62	23.15
4 in. o.d....10 B.W.G.	35.20	30.54	28.66
4½ in. o.d...10 B.W.G.	43.04	37.35	35.22
5 in. o.d.... 9 B.W.G.	54.01	46.87	44.25
6 in. o.d.... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
½ in. & 6 in. and smaller.	65, 5 and 5*
Larger and longer up to 1 in.	60, 10 and 5*
1⅛ in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
½ in. and smaller	65 and 5
9/16 in. to 1 in. inclusive.	60, 5 and 5
1⅛ in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carloads lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

	S.A.E.	
Semi-fin. hexagon nuts	U.S.S.	
1/14 to 7/16 in. incl.	65-10	70-5
½ to 9/16 in.	65-5	70
⅝ to 1-in. incl.	60-10	65
1⅛ in. and larger	60-5	60-5

Beyond the above, an additional 10 per cent allowed for full container quantities.

Stove bolts in packages, nuts attached	75
Stove bolts in packages, with nuts separate	75 and 12½
Stove bolts in bulk	85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham $3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .... 65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67½ and 10
Upset set screws, cup and oval points	75 and 10
Milled studs	60½ and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.

Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2100 (1½% Nickel)	0.75
2300 (3½ Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 5c a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£14 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £.
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$21.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	21.00
Delivered Brooklyn	23.50
Delivered Newark or Jersey City	22.53
Delivered Philadelphia	21.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago and Youngstown*	21.00
F.o.b. Buffalo	$20.00 to 21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.95
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$21.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	20.50
F.o.b. Buffalo	$20.00 to 21.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago and Youngstown	20.50
Delivered Philadelphia	21.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$21.00 to $22.00
F.o.b. Everett, Mass.	22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	22.00
Delivered Newark or Jersey City	23.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$25.50 to $26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $92.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% $30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$92.75
2.50% carbon	97.75
2% carbon	102.75
1% carbon	112.75

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron. Nominally 17 to	18c.
Iron, basic or foundry, Swedish, aver. 65% iron. Nominally	15c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	35c.
Man., African, Indian 44-48%	33c.
Man., African, Indian. 49-51%	35c.
Man., Brazilian, 46 to 48½%	33c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$20.00
Tungsten, domestic, scheelite delivered	$19.00 to $20.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	15.00
Rhodesian, 45%	19.50
Rhodesian, 48%	23.00
Turkish, 48-49%	23.50 to 24.50
Turkish, 45-46%	22.50
Turkish, 44%	18.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	24.50 to 25.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	$18.00 to 19.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2 or diesel, f.o.b. Bayonne	4.00c.
No. 6, f.o.b. Bayonne	2.26c.
Del'd Chicago, No. 5 Bur. Stds.	3.25c.
Del'd Chicago, No. 6 Bur. Stds.	2.75c.
Del'd Cleve'd, No. 3 distillate	5.50c.
Del'd Cleve'd, No. 4 industrial	5.00c.
Del'd Cleve'd, No. 5 industrial	3.25c.
Del'd Cleve'd, No. 6 industrial	3.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.55c.
Shapes	3.55c.
Soft steel bars and small shapes	3.60c.
**Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.95c.
Hot rolled strip	3.75c.
Hot rolled sheets	3.50c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.75c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb.

** On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge.

All above prices for delivery within the Pittsburgh switching district.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.83c.
Structural shapes	3.75c.
Soft steel bars, round	3.94c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds, squares, hexagons	4.39c.
Flats up to 12 in. wide	4.39c.
Cold-rolled strip, soft and quarter hard	3.66c.
Hot-rolled strip, soft O.H.	4.11c.
Hot-rolled sheets (10 ga.)	3.73c.
Galv. sheets (24 ga.)	4.60 to 4.85c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.90c.
Deep drawing	5.15c.
Stretcher leveled	5.50c.
SAE, 2300, hot-rolled	7.50c.
SAE, 3100, hot-rolled	6.10c.
SAE, 6100, hot-rolled annealed	10.25c.
SAE, 2300, cold-rolled	8.69c.
SAE, 3100, cold-rolled, annealed	7.29c.
Floor plate, ⅛ in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	$3.25

CLEVELAND

	Base per Lb.
Plates	3.55c.
Structural shapes	3.73c.
Soft steel bars	3.50c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb., over)	4.05c.
Hot-rolled strip, 6 in. wide and under	3.65c.
Cold rolled sheets	4.70c.
Cold-finished strip	3.35c.
Galvanized sheets (No. 24)	4.68c.
Hot-rolled sheets	3.50c.
Floor plates, 3/16 in. and heavier	5.33c.
*Black ann'l'd wire, per 100 lb.	$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	6.05c.
Cold rolled alloy steel (3115)	6.85c.

* For 5000 lb. or less
† 500 lb., base quantity.

ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.82c.
Bars, soft steel (rounds and flats)	3.87c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.02c.
Cold fin. rounds, shafting, screw stock	4.32c.
Galv. sheets (24 ga.)	4.77c.
Hot rolled sheets	3.77c.
Galv. corrugated sheets, 24 ga. and heavier*	4.82c.
Structural rivets	5.02c.

* No. 26 and lighter take special prices.

BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	5.85c.
Plates, ¼ in. and heavier	3.85c.
Bars	3.98c.
Heavy hot rolled sheets	3.86c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.76c.
Galvanized sheets	4.76c.
Cold rolled sheets	4.93c.

BUFFALO

Plates	3.77c.
Floor plates	5.40c.
Struc. shapes	3.55c.
Soft steel bars	3.60c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	4.05c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl. also sizes No. 8 to 30 ga.	3.50c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.97c.

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$47.50
Chicago District	56.05
Birmingham	47.50
Silica cement per net ton (Eastern)	8.55

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah Wash. (in bulk)	22.00

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.92c.
*Structural shapes	3.92c.
*Soft steel bars, small shapes, iron bars (except bands)	4.03c.
‡Reinforc. steel bars, square and deformed	3.46c.
Cold-finished steel bars	4.56c.
*Steel hoops	4.63c.
*Steel bands, No. 12 and 3/16 in. incl.	4.13c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	4.90c.
*Hot-rolled annealed sheets (No. 10)	4.03c.
*Diam. pat. floor plates, ¼ in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

BIRMINGHAM

Bars and bar shapes	$3.85 base		
Structural shapes and plates	3.75	"	
Hot rolled sheets No. 10 ga.	3.80	"	
Hot rolled sheets No. 24 ga.	4.40	"	3500 lb. and over
Galvanized sheets No. 24 ga.	5.05	"	3500 lb. or more
Strip	4.05	"	
Reinforcing bars	3.85	"	
Floor plates	5.96	"	
Cold finished bars	4.91	"	
Machine and carriage bolts	.50 & 10 off list		
Rivets (structural)	$4.60 base		

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.95c.	4.30c.	4.25c.
Shapes, standard	3.95c.	4.30c.	4.25c.
Soft steel bars	4.05c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.675c.	2.975c.	2.975c.
Hot-rolled annealed sheets (No. 24)	(—)	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.10c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.25c.	5.05c.	....
Galv. sheets (No. 22 and heavier)	5.50c.	5.05c.	....
Cold-finished steel			
Rounds	6.55c.	6.85c.	7.10c.
Squares and hexagons	7.80c.	8.10c.	7.10c.
Flats	8.30c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.20	$3.05	$3.40

All items subject to differentials for quantity.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

FABRICATED STEEL

. . . Lettings of 22,225 tons are back to level of three weeks ago after spurt to 66,590 tons last week . . . New projects higher at 21,025 tons against 13,715 tons a week ago . . . Plate awards at 1015 tons.

NORTH ATLANTIC STATES
AWARDS

4530 Tons, Westchester County, N. Y., Delaware Aqueduct, Contract No. 307, to Commercial Shearing & Stamping Co., Youngstown.

3500 Tons, Westchester County, N. Y., Delaware Aqueduct, Contract No. 324, to Commercial Shearing & Stamping Co., Youngstown.

3400 Tons, Westchester County, N. Y., Delaware Aqueduct, Contract No. 322, to Dravo Contracting Co., Pittsburgh.

750 Tons, Philadelphia, heavy materials store house, Navy Yard, to Belmont Iron Works, Philadelphia.

387 Tons, Queens, N. Y., ramps at Linden Street, to American Bridge Co., Pittsburgh.

345 Tons, Pittsburgh, Arsenal School, to Bethlehem Steel Co., Bethlehem, Pa.

336 Tons, Storrs, Conn., engineering building, to Haarman Steel Co., Holyoke.

300 Tons, Portsmouth, N. H., two Navy Yard plant additions to American Bridge Co., Boston.

240 Tons, Brockport, N. Y., normal school building, to Bethlehem Steel Co.

233 Tons, East Orange, N. J., 4-story apartment building at Prospect Street, to Standard Structural Steel Co., Hartford.

220 Tons, Philadelphia, alterations to University of Pennsylvania, to Belmont Iron Works, Philadelphia, through Turner Construction Co., Philadelphia.

200 Tons, Pawtucket, R. I., high school to providence Steel & Iron Co., Providence; E. Turgeon, contractor.

200 Tons, Trenton, N. J., building for Trenton Trust Co., to Bethlehem Fabricators, Bethlehem, Pa.

200 Tons, Newport, R. I., storage facilities, Naval Torpedo Station, to American bridge Co., Pittsburgh.

180 Tons, Tewksbury, Mass., bridge, to American Bridge Co.; Coleman Brothers, Boston, contractors.

165 Tons, Wellsville, N. Y., 2 bldgs. and tower, to Pittsburgh Bridge & Iron Works, Pittsburgh.

140 Tons, Irasburg, Vt., Hancock and Village bridges, to Bethlehem Steel Co., Bethlehem, Pa.

135 Tons, Jamaica, N. Y., Registrars building for U. S. Treasury Department, to Lehigh Structural Steel Co., Allentown, Pa.

135 Tons, Kittery, Me., ext. to building No. 80, Navy Yard, to American Bridge Co., Boston.

115 Tons, Fort Bevans, Mass., garage, to New England Structural Co., Everett, Mass.

115 Tons, Yeadon, Pa., addition to school, to American Steel Engineering Co., Philadelphia, through M. & L. Construction Co., Philadelphia.

110 Tons, Philadelphia, Mt. Oreca Street highway bridge, to Bethlehem Steel Co., Bethlehem, Pa., through H. R. Dickinson, Philadelphia.

100 Tons, Wayne, Pa., school additions, to Morris-Wheeler Co., through J. Marcellus & Co., Philadelphia.

100 Tons, Bethel, Me., boys' dormitory, Gould Academy, to Megquier & Jones, Portland, Me.

THE SOUTH

437 Tons, Colorado County, Texas, bridge, to Commercial Iron Works, Houston; Russ Mitchell Co., Houston, general contractor.

420 Tons, Elkton, Va., state highway bridge, to Virginia Bridge & Iron Co., Roanoke, Va.; Haley, Chisholm & Morris, general contractor.

136 Tons, Franklin County, Ky., state highway bridge, to Vincennes Steel Corp., Vincennes, Ind.

110 Tons, Norfolk, Va., hangar building, to Belmont Iron Works, New York.

CENTRAL STATES

1400 Tons, Cleveland, West approach to Main Street Bridge, to Mt. Vernon Bridge Co., Mt. Vernon, Ohio; Sam W. Emerson Co., Cleveland, general contractor.

750 Tons, Hannibal, Mo., armory, to Illinois Steel Bridge Co., Jacksonville, Ill.

700 Tons, Oberlin, Ohio, college auditorium, to R. C. Mahon Co., Detroit.

350 Tons, Chicago, Clorox factory building, to Joseph T. Ryerson & Son, Inc., Chicago.

240 Tons, Scott Field, Ill., two warehouses for U. S. Government, to Atlas Iron Works Corp., Chicago.

224 Tons, Jackson, Mich., Woolworth Co. store, to American Bridge Co., Pittsburgh.

165 Tons, guard gates, lock No. 41, Ohio River, for U. S. Engineers, to Milwaukee Bridge Co., Milwaukee.

125 Tons, Paxico, Kan., railroad bridge, to Bethlehem Steel Co., Bethlehem, Pa.

WESTERN STATES

400 Tons, Coram, Cal., viaduct, to American Bridge Co.

240 Tons, Vernon, Cal., Swift & Co. plant, to Western Pipe & Steel Co., Los Angeles; Austin Co., Los Angeles, general contractor.

165 Tons, Crownover, Wash., bridges, Yakima-Roza Diversion Dam for U. S. Bureau of Reclamation, to American Bridge Co.

120 Tons, Rio Arriba Co., N. M., highway bridge FAP-100-E, to Midwest Steel & Iron Works, Denver.

107 Tons, San Francisco, H-piles for Fort Mason, to Columbia Steel Co., San Francisco.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

6000 Tons, New York, Hunter College building.

2500 Tons, New York, apartment house for 140 Riverside Drive, Inc.

700 Tons, Westfield, Mass., Great River bridge.

700 Tons, Cheektowaga, N. Y., factory building for Spencer Lens Co.

700 Tons, Woodbridge, N. J., Pennsylvania Railroad grade elimination, J. A. Stewart & Co., New York, low bidders.

600 Tons, Philadelphia, reserve basin storehouse, Navy Yard.

350 Tons, New York, steel curbing for city.

300 Tons, Iona Island, N. Y., wharf extension for U. S. Marine Corps.

300 Tons, Hornell, N. Y., including 35 tons reinforcing bars, highway project R.C. 3998; bids close Oct. 11.

300 Tons, sanatorium, Hamburg, N. Y.; bids due Oct. 4.

270 Tons, Bucks County, Pa., highway bridge.

250 Tons, Cambridge, Mass., municipal garage.

250 Tons, Flushing, N. Y., World's Fair building for Soviet government.

165 Tons, Plainfield, N. J., buildings for Muhlenberg Hospital.

150 Tons, Charlestown, Mass., General Baking Co. garage.

THE SOUTH

750 Tons, Norfolk, Va., barracks, trade school, etc., for U. S. government.

600 Tons, Port Arthur, Tex., power house, etc., for the Texas Co.

600 Tons, Port Royal, S. C., bridge.

CENTRAL STATES

1500 Tons, Flint, Mich., building and bridge for General Motors Corp. (Buick Motors Car Division).

1200 Tons, Chicago, Austin Avenue, Milwaukee Railroad grade separation.

600 Tons, Pekin, Ill., addition to building for Corn Products Refining Co.

500 Tons, Dover, Ohio, state bridge, Wooster Avenue.

350 Tons, Clark County, Ohio, State bridge in Mad River Township, Proposal No. 3, Unit, 2; bids Oct. 4.

350 Tons, Marquette, Mich., Masonic Temple.

300 Tons, Cleveland, East Ninth Street bridge. Bids soon.

270 Tons, Eureka, Kan., state bridge over Fall River.

200 Tons, Grand Rapids, Mich., State bridge.

125 Tons, Sidney, Ohio, factory building for Monarch Machine Tool Co.

WESTERN STATES

144 Tons, Skamokawa, Wash., steel swing bridge of State Road 12; McRae Brothers, Seattle, general contractors.

FABRICATED PLATES

AWARDS

424 Tons, Baytown, Texas, nine storage tanks, for Humble Oil & Refining Co., to Chicago Bridge & Iron Co., Chicago.

325 Tons, Fresno, Cal., 1,000,000-gal. elevated tank, to Chicago Bridge & Iron Co., San Francisco.

266 Tons, Pittsburgh, oil barge for Campbell Transportation Co., to Dravo Contracting Co., Pittsburgh.

PROJECTS

500 Tons, Boston Transit Department, 42 in. welded steel water pipe, for Huntington Avenue subway extension.

SHEET PILING

PROJECTS

300 Tons, Tuscarawas County, Ohio, bearing piles for State of Ohio. Bids Oct. 5.

170 Tons, Belmont County, Ohio, project No. 206, Kirkwood and Richland Townships for State of Ohio. Bids Sept. 30.

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Only a few leading manufacturers are in the market now . . . Germany said to be inquiring for machine tools . . . Ford buying equipment for making cylinder bore liners.

German Inquiries Reported From Cleveland

CLEVELAND—Germany has been more active recently in the machine tool market in this country than at any time since the World War, in the opinion of a number of executives here. One large inquiry called for $70,000 worth of equipment, with prompt cash payment guaranteed 30 days from date of order. Where this order or other smaller contracts have been placed is unknown here, but the revival indicated by the inquiries has been a topic of live interest among manufacturers. The German market has been inactive for many years. Germany this year has been building up foreign exchange with Brazil by importing large amounts of coffee in return for German products and establishing credit on the balance in the United States.

Only One Active Buyer in Mid-West Region

CHICAGO—Allis-Chalmers Mfg. Co. recently placed orders for a number of high speed drills, some radial drills, and several small punch presses. This equipment is headed for the La Porte, Ind., implement plant, which for some time has been one of the company's most active locations. Production is about to start on a new small combine-harvester at this point. Little other important buying has been reported. Small tool demand continues to increase somewhat, but a comparison will not be possible until figures are made available at the end of September. It is regarded as fairly certain among the trade here that no price decreases will be seen. Some upward adjustments of a minor nature already have been made, and more may be announced later.

Aircraft and Navy Plants Lead in Buying in East

NEW YORK—Machine tool buying in general at present is very light and has been showing slight progressive weekly losses. There is, however, an undertone of optimism due to the heavy inquiry still pending. Wright Aeronautical Corp. is still buying actively (grinders last week), but the buying program of the Brooklyn Navy yard is still in the blueprint stage, although some of the heavy work is expected to be out for bids in the next four weeks. The Boston Navy yard has issued an inquiry for a large floor-type boring machine, while the Portsmouth yard is taking bids on three table-type boring machines, a miller, and a radial drill. It is understood that these yards have further lists under consideration. No new industrial lists were issued last week, except the Wright inquiries, which have been coming out steadily.

Cincinnati Finds Inquiry Much Better Than Orders

CINCINNATI—Except for the steadily mounting potential business, the district machine tool market reflects no new features. The steady flow of inquiry indicates a wide interest in virtually all types of tools. Quotations on all but current requests have been made and the trade indicates that these propositions have a sincere background, but buyers are still awaiting the general business trend before making definite commitments.

New business the past week was in about the same proportion as the preceding week, with foreign orders predominating.

Ford Buying New Equipment For Cylinder Bore Liners

DETROIT—New equipment is being purchased by Ford for the manufacture of cylinder bore liners which it is understood will be used both in passenger car and truck engines. In addition it is understood that proposals have been made to Ford for almost a quarter million dollars' worth of special surface finishing equipment.

. . .OBITUARY. . .

CLIFTON REEVES, former vice-president and secretary of Mullins Mfg. Corp., Salem, Ohio, died Sept. 20 at his home in Trenton, N. J., following a heart attack. He was 62. Mr. Reeves served as an official of the Mullins company from 1929 until 1933.

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GEORGE P. BASSETT, JR., in charge of pig iron sales for Wieman & Ward Co., Pittsburgh, and a pioneer in the pig iron industry, died at Pittsburgh recently. At the turn of the century he represented Rogers, Brown & Co. in the Pittsburgh territory and later formed the G. P. Bassett Co. to deal in pig iron, coke and alloys.

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THEODORE A. HAMMOND, vice-president and treasurer of the Charter Oak Stove & Range Co., St. Louis, until his retirement in 1933, died of the infirmities of age. He was 86 years old. He was born in St. Louis, and was connected with the company for 60 years.

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CHARLES SUTHERLAND, employment manager of the Motor Wheel Corp., died Sept. 20 as a result of a heart attack at the age of 42 years. He had been with the firm for 15 years.

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JOSEPH WOLF, founder of Wolf & Co., dealers in scrap and foundry iron at Hamilton, Ohio, died of a heart attack last Friday at a hospital in Cincinnati. He was 65 years old. As a boy he began work with his uncle, Joseph Joseph, who was then engaged in the scrap iron business. Later he was employed by another uncle, Isaac Joseph, and represented his business in Savannah, Ga. About 30 years ago, Mr. Wolf became associated with the late Bern Wolf, who had established a scrap and foundry iron business in Hamilton. Later he obtained full control of the business. Associated with him were his son, William Wolf, and his son-in-law, Bernard Hirschhorn.

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ANGUS GILLIES, who had been an engineer with the Ford Motor Co. for 25 years, died Aug. 21, aged 75 years. Previous to his connection with the Ford company he had been with the Detroit Edison Co. and Morgan & Wright Co. He was born on the Isle of Lewis, Stronaway, Scotland.

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JOHN R. GRIFFITH, who has been identified with the Chippewa (Ont.) plant of the Norton Co., Worcester, Mass., died on Sept. 6, aged 56 years. He was graduated as a metallurgical engineer from the Colorado School of Mines and joined the Norton Co. in 1911.

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EDWARD L. BUELL, former traffic manager for the Brown Hoisting Machinery Co. and later for the Wellman - Seaver - Morgan Co., both of Cleveland, who retired eight years ago, died in a Cleveland hospital Sept. 16, aged 68 years. Since his retirement he had been associated at times with his son, Edward J. Buell, of Niagara Falls, N. Y., president of the Niagara Wire Weaving Co. Mr. Buell, who was born in Stockton-on-Tees, England, was widely known in Cleveland.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Quartermaster, West Point, N. Y., asks bids until Oct. 3 for quantity of jaws for bolt clippers, wire brads, nails, files, escutcheon pins and other equipment (Circular 40).

Mack Sign Co., 4846 Broadway, New York, manufacturer of signs and displays, has leased three-story building at 315 West Fifty-third Street, and will equip and occupy for plant.

Jenkins Brothers, 80 White Street, New York, manufacturer of valves, mechanical rubber goods, etc., has leased two-story and basement building at Fulton and Justine Streets, Chicago, and will occupy for expansion in local factory branch, storage and distributing plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 4 for one motor-driven contour metal-sawing combination machine (Schedule 4401); until Oct. 7 for quantity of pressure gages (Schedule 4432), 200 cylinder regulators (Schedule 4419), quantity of gyro-compass equipment and spare parts (Schedule 4433) for Brooklyn Navy Yard.

Department of Docks, Pier A, North River, New York, has secured appropriation of $7,282,000 from Board of Estimate for expansion in new municipal airport at North Beach, Queens, of which about $3,300,000 will be used for three new steel hangars, each approximately 165 x 350 ft., with repair and conditioning facilities. Plans are under way and work is scheduled to begin before close of year.

Board of Education, Park Avenue and 59th Street, New York, has let general contract to J. Weinstein & Rubin Building Corp., 11 West 42nd Street, for new 11-story and basement industrial high school on site between Seventh and Eighth Avenues, 24th to 25th Street, to be known as High School of Needle Trades. Installation will include a series of 65 shops and six laboratories. Cost over $4,500,000 with equipment.

Signal Corps Procurement District, Army Base, 58th Street and First Avenue, Brooklyn, asks bids until Oct. 17 for 400,640 lin. ft. of wire and cable, and 20 reels; 100,000 lin. ft. of cable and 100 reels; 29,700 lin. ft. of cable and 19 reels; 10,450 lin. ft. of cable and seven reels; 1900 lin. ft. of cable and one reel; 43,600 lin. ft. of cable and 44 reels; 800 lin. ft. of cable and one reel; and 120 lin. ft. of cable and one reel (Circular 47).

Central School District, (No. 8) Goshen, N. Y., plans manual training department in new three-story high and grade school, for which general contract has just been let to J. A. J. & Sons, Inc., 268 41st Street, Brooklyn. Cost $645,000. Financing has been arranged through Federal aid. R. R. Graham, 25 Prospect Street, Middletown, N. Y., is architect.

Quartermaster Supply Office, Brooklyn, asks bids until Oct. 13 for one air compressor, six laundry presses, one extractor (Circular 59).

Wright Aeronautical Corp., 132 Beckwith Avenue, Paterson, N. J., has aked bids on general contract for two-story addition, 200 x 250 ft., to be used for assembling and other operations. Cost close to $125,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Commanding Officer, Ordnance Department, Picatinny Arsenal, near Dover, N. J., asks bids until Oct. 4 for 360 condulet bodies (Circular 238); until Oct. 10 for 2000 gears (Circular 239).

Victor-Springfield Tire Co., Fifth and Buttonwood Streets, Philadelphia, is considering rebuilding four-story plant recently destroyed by fire. Loss close to $200,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 14 for one steel power brake press (Schedule 4434) for Philadelphia Navy Yard.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Oct. 4 for two electric guns with 14 lin. ft. of high-pressure hose (Circular 271).

Supply Officer, Naval Aircraft Factory, Philadelphia, asks bids until Oct. 4 for 670 corrosion-resistant steel tie rods for airplane service (Aero Req. 502-573).

BUFFALO DISTRICT

Agfa-Ansco Corp., Charles Street, Binghamton, N. Y., has let general contract to Wark & Co., 1608 Walnut Street, Philadelphia, for one-story addition for extensions in casting division. Cost about $150,000 with equipment. Lockwood Greene Engineers, Inc., 30 Rockefeller Plaza, New York, is architect and engineer.

Comstock & Westcott, Inc., 3986 Royal Avenue, Niagara Falls, N. Y., engineer, has plans for new sulphur refining plant at copper refinery of Aldermac Copper Co., Ltd., Rouyn, Que., comprising several units with rotary kilns and auxiliary equipment. Work is scheduled to begin this fall. Cost about $350,000 with machinery.

NEW ENGLAND

State Department of Public Works, State Office Building, Hartford, Conn., has let general contract to E. & F. Construction Co., 78 Wells Street, Bridgeport, Conn., for new engineering building at Connecticut State College, Storrs, Conn. Cost about $300,000 exclusive of equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Oct. 3 for 36 lathe tools (Circular 78), five electrical factory-type unit heaters (Circular 81); until Oct. 4 for quantity of parts for Browning machine gun, caliber .30, 13,000 screws, 3000 slides, 3000 rear sight heads, 6000 rear sight adjusting plate screws, 3000 adjusting plates, 3000 nuts, etc. (Circular 79); until Oct. 10 for one motor-driven hob reamer and cutter grinder (Circular 65), two comparator and measuring projectors (Circular 67), four universal milling machines (Circular 62); until Oct. 11 for two universal tool and cutter grinders (Circular 63), two single-spindle, 24-in. vertical drill presses (Circular 64), one vertical spindle milling machine, four cutter adapters, two arbors (Circular 66).

Board of School Trustees, Chicopee, Mass., has approved plans for new two and one-half story trade school at Quarry Avenue and Front Street. Cost over $110,000. Financing has been arranged through Federal aid. Work is scheduled to begin soon. Henry J. Tessier, 220 Dwight Street, Springfield, Mass., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 7 for three motor-driven oxygen cutting machines (Schedule 4441), one heavy-duty radial drill (Schedule 4443), for Portsmouth, N. H., Navy Yard; until Oct. 4 for one pillar crane (Schedule 4408); until Oct. 7 for two bench lathes (Schedule 4415) for Newport, R. I., naval station.

WASHINGTON DIST.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Oct. 19 for one-story steel foundry building, 180 x 408 ft., with outside overhead crane runway, and crane runways for interior crane, at Navy Yard, Mare Island, Cal. (Specifications 8816).

Burd Model Airplane Co., 103 West Pratt Street, Baltimore, manufacturer of airplanes and parts, has leased one-story industrial building at 2113-17 East Oliver Street, and will occupy for plant, including parts production and assembling.

General Purchasing Officer, Panama Canal, Washington, asks bids until Oct. 4 for quantity of steel nuts, steel machine bolts, brass bolts, carriage bolts, brass machine screws, brass wood screws, steel rivets, expansion shields, machinist's hammers, brass washers, etc. (Schedule 3385); until Oct. 10 for 19 chipping hammers, one motor-driven floor grinder, one twist drill grinding attachment, quantity of brake shoes, metallic safety treads and other equipment (Schedule 3386).

Virginia Electric & Power Co., Richmond, Va., has engaged Stone & Webster Engineering Corp., 49 Federal Street, Boston, consulting engineer, to prepare plans for addition to steam-electric generating plant on 12th Street, to include installation of new 40,000-kw. generating unit and auxiliary equipment. Cost about $3,000,000. Company has arranged for a bond issue of $37,500,000, from which fund noted will be secured. Work is scheduled for completion early in 1940.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 7 for one heavy-duty engine lathe (Schedule 4442), one universal milling machine (Schedule 4425), one heavy-duty engine lathe (Schedule 4422), and one toolroom universal heavy-duty 16-in. shaper (Schedule 4427) for White Plains, Md., yard; four boring mills and additional tools (Schedule 4350); until Oct. 11 for one semi-automatic thread milling machine and equipment (Schedule 4460) for Alexandria, Va., yard; all machines to be motor-driven; quantity of ventilation equipment and spare parts (Schedule 4446) for various navy yards.

SOUTH ATLANTIC

American Enka Corp., Enka, N. C., manufacturer of cellulose rayon products, has let general contract to Potter & Shackelford, Inc., Allen Building, Greenville, S. C., for one-story addition, to be equipped for expansion in chemical division. Cost close to $50,000 with equipment.

Charlotte Mfg. Co., Charlotte, N. C., manufacturer of textile machinery and parts, plans installation of additional equipment for considerable increase in present capacity. Company recently has disposed of loom reed department to Emmons Loom Harness Co., Lawrence, Mass., and will use vacated space for machinery additions. Emmons company, noted, is arranging for establishment of new branch plant at Charlotte for production of textile looms and auxiliary equipment.

City Commission, Sanford, Fla., plans new municipal electric light and power plant, and electrical distributing system. Cost about $390,000. Financing is being arranged through Federal aid.

SOUTH CENTRAL

City Council, Mobile, Ala., plans large three-story industrial terminal on waterfront, with cranes, conveyors, electric hoists and other loading and mechanical-handling equipment. Cost about $1,200,000 with equipment. Application has been made for Federal loan and grant.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Oct. 3 for designing and furnishing one 1250-hp. induction or synchronous motor, with control panels, controls and auxiliary equipment for dredge "Dallas," located at Pickwick Dam; until Oct. 6 for designing, furnishing and fabricating three steel buildings for construction plant at Gilbertsville Dam, two structures to be about 72 x 260 ft., and one building, 72 x 140 ft.

City Council, Lafayette, La., plans extensions and improvements in municipal electric power plant, including installation of new generating unit and accessory equipment. Cost about $160,000. Financing is being arranged through Federal aid.

Hind County Board of Supervisors, Courthouse Building, Jackson, Miss., asks bids until Oct. 3 for new one-story meat-packing plant at Raymond, Miss., to be operated as a county enterprise. Also at same time for complete

TWO TONS OF EVIDENCE . . .

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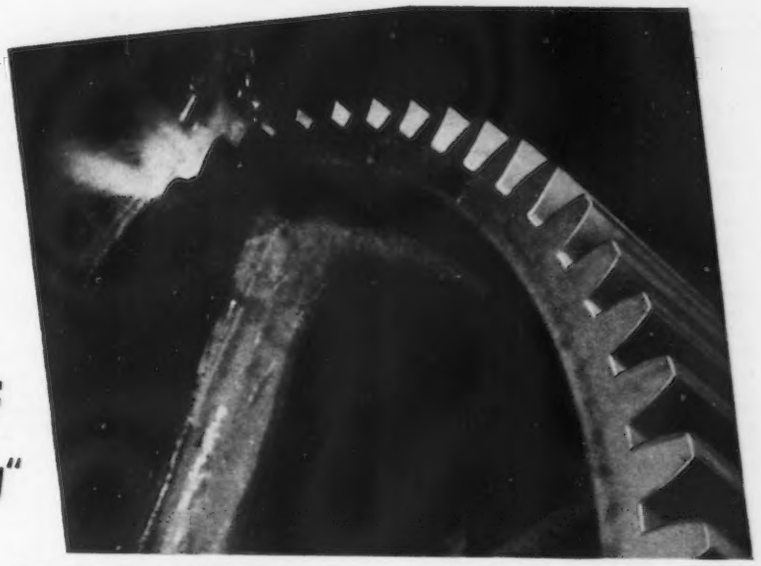
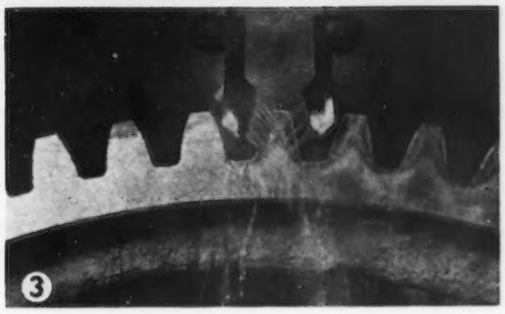


with AIRCO FLAME HARDENING EQUIPMENT



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2. ***Heating the tooth.***

3. ***Quenching.***

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THIS 6-foot, 4250-pound gear furnishes a fine example of the advantages of oxyacetylene flame hardening with AIRCO Equipment. To harden the teeth of this big gear by usual methods would be a slow, difficult, costly job. But with AIRCO Flame Hardening Equipment it is reduced to a comparatively simple proposition, with no warpage problem because *heating is confined to the areas where hardness is needed.*

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AIR REDUCTION

SALES COMPANY

General Offices: 60 East 42nd St., New York, N. Y.

DISTRICT OFFICES and DISTRIBUTING STATIONS in PRINCIPAL CITIES

equipment for plant. James M. Spain, Deposit Guaranty Building, Jackson, is architect.

SOUTHWEST

Cole Chemical Co., Inc., 3721-27 Laclede Avenue, St. Louis, manufacturer of industrial chemicals, drug specialties, etc., has asked bids on general contract for two-story and basement plant, 30 x 100 ft., with L-extension, 55 x 120 ft., on site of present building. Cost close to $100,000 with equipment. Hugo L. Graf, 2825 Olive Street, is architect.

City Council, Liberty, Mo., plans municipal electric light and power plant, and electrical distributing system. Cost about $300,000. Financing is being arranged through Federal aid. W. B. Rollins & Co., Railway Exchange Building, Kansas City, Mo., are consulting engineers.

Mid-Continent Petroleum Corp., Tulsa, Okla., plans expansion and improvements in oil refining plant at West Tulsa, with installation of additional equipment for large increase in capacity, including new steel tanks for storage and distribution. Cost close to $1,000,000 with equipment. Work is scheduled to begin late in October. Fred B. Koontz is vice-president.

Board of Education, Library Building, Kansas City, Mo., George C. Tinker, secretary, has let general contract to J. E. Dunn Construction Co., Reliance Building, for two, three and four-story addition to manual training high school at 15th Street and Forest Avenue. Four-story section, 108 x 124 ft., will be equipped with vocational shops. Cost about $580,000 with equipment. Financing has been arranged. Charles A. Smith and Nate W. Downes, both Finance Building, are architect and mechanical engineer, respectively.

Southern Fruit Corp., Alamo, Tex., canner and packer of food products, has asked bids on general contract for two-story addition. Cost over $40,000 with equipment. Carl Bressett is general manager.

City Council, Post, Tex., plans new municipal electric power plant, using diesel engine-generating units and accessory equipment. Also new electrical distributing system. Cost about $100,000. Financing is being arranged through Federal aid. H. N. Roberts, Lubbock, Tex., is consulting engineer.

Board of Education, Seguin, Tex., will take bids soon on general contract for two-story addition to high school, to be equipped as a vocational shop department. Financing has been arranged through Federal aid. Atlee B. and Robert M. Ayres, Smith-Young Tower Building, San Antonio, Tex., are architects.

WESTERN PA. DIST.

Gulf Refining Co., Gulf Building, Pittsburgh, plans expansion in bulk oil storage and distributing plant at Munsey Avenue and Ash Street, Scranton, Pa., including new one-story building, steel tanks and other equipment. Cost close to $50,000 with equipment.

H. J. Heinz Co., 1062 Progress Street, North Side, Pittsburgh, has asked bids on general contract for extensions and improvements in branch plant at 342 North Western Avenue, Chicago, including new one-story service unit. Cost over $45,000 with equipment. Clarence A. Jensen and N. Max Dunning, 306 South Wabash Avenue, Chicago, are architects. Company also has approved plans for one-story addition to branch plant at Holland, Mich., for which superstructure will begin at once. Cost about $40,000 with equipment.

OHIO AND INDIANA

Dill Mfg. Co., 694 East 82nd Street, Cleveland, manufacturer of screw machine products, sheet metal stampings, etc., has asked bids on general contract for four-story addition, 50 x 60 ft. Cost over $65,000 with equipment. Roberts-Wright Co., Swetland Building, is architect and engineer.

U. S. Steel Wire Spring Co., 1296 East 53rd Street, Cleveland, manufacturer of steel springs, wire forms, etc., has leased one-story industrial building at 7800 Finney Avenue, owned by Stewart-Warner Corp., Chicago, and will remodel and improve for new plant. General contract has been let to Harris Construction Co., Hippodrome Building, for latter work. Present plant will be removed to new location and capacity increased.

National Terminals Corp., 1200 West Ninth Street, Cleveland, plans rebuilding of one of units of industrial terminal at East 54th Street and Lakefront, recently destroyed by fire. Loss over $150,000 with equipment.

Monarch Machine Tool Co., Sidney, Ohio, manufacturer of lathes, parts, etc., has asked bids on general contract for one-story plant and office building on local site. Cost about $120,000 with equipment. Schenck & Williams, Third National Bank Building, Dayton, Ohio, are architects.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Oct. 5 for three metal tanks (Circular 174), for large quantities of shaft assemblies (Circular 175).

City Council, City Hall, Cincinnati, C. O. Sherrill, city manager, has authorized plans for one-story municipal service, repair and garage building at Bates Avenue and Central Parkway, including equipment shops. Cost about $510,000 with equipment. Financing has been arranged through Federal aid. Tietig & Lee, 34 West Sixth Street, are architects.

Allis-Chalmers Co., Milwaukee, has let general contract to Lovering Construction Co., LaCrosse, Wis., for one-story addition to branch plant at La Porte, Ind., 206 x 370 ft. Cost over $175,000 with equipment.

MICHIGAN DISTRICT

City Council, Charlevoix, Mich., plans extensions and improvements in municipal electric power plant, including installation of additional equipment. Cost about $126,000. Financing is being arranged through Federal aid. Hamilton & Weeber, Grand Rapids, Mich., are consulting engineers.

Buick Motor Division, General Motors Corp., Flint, Mich., is having plans completed by Albert Kahn, Inc., New Center Building, Detroit, architect and engineer, for two-story addition, 310 x 750 ft., replacing two existing plant buildings. General contract for erection will be placed soon. Cost over $500,000 with equipment.

Shaw-Box Crane & Hoist Co., Muskegon, Mich., manufacturer of traveling cranes, electric hoists, etc., has begun erection of one-story addition and will equip at later date for welding division at plant. Cost over $60,000 with equipment.

City Council, Zeeland, Mich., plans extensions and improvements in municipal electric power plant, including installation of additional equipment. Cost about $55,000. Financing has been arranged. Ayres, Lewis, Norris & May, Ann Arbor, Mich., are consulting engineers.

MIDDLE WEST

Chromium Corp. of America, Inc., 4645 West Chicago Avenue, Chicago, has let general contract to Robert G. Regan Co., 228 North La Salle Street, for one-story top addition to plant, location noted, 50 x 125 ft. Cost over $50,000 with equipment. W. Fred Dolke, 189 West Madison Street, is architect.

Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, has plans for new one-story coach construction and repair shop at general repair works at Danville, Ill., to replace a structure destroyed by fire a number of weeks ago. Cost about $200,000 with equipment. J. S. McBride, Sixty-sixth Street and Union Avenue, Danville, is engineer.

State Board of Administration, State House, Bismarck, N. D., will take bids early in October for extensions and improvements in power plant at institution at Jamestown, N. D., including new electric generating unit and accessories, boilers, pumps and auxiliary equipment. Cost close to $150,000. Financing has been arranged in part through Federal aid. William F. Kurke, 1117 Thirteenth Avenue, North, Fargo, N. D., is consulting engineer.

United States Engineer Office, Rock Island, Ill., asks bids until Oct. 6 for one-story pumping stations and garage and service buildings at each of nine locks and dams on Mississippi River (Circular 82).

Board of Education, Des Moines, Iowa, plans new one-story vocational building at East Side high school. Cost about $80,000. Financing is being arranged through Federal aid. A. W. Merrill is superintendent of board in charge.

Reflector Hardware Corp., 2245 South Western Avenue, Chicago, manufacturer of metal lighting fixtures and allied specialties, has let general contract to F. C. Klemp, 2607 Cermak Road, for three-story addition, 24 x 92 ft. Cost close to $70,000 with equipment. Taussig, Flesch & Associates, 59 East Van Buren Street, are architects.

City Council, Remsen, Iowa, asks bids until Oct. 10 for extensions and improvements in municipal electric power plant, including installation of additional equipment. Cost about $56,000. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is consulting engineer.

PACIFIC COAST

Clorox Chemical Co., 850 Forty-second Avenue, Oakland, Cal., manufacturer of industrial and other chemical products, plans new two and three-story branch plant at 51st Street and Merrimac Avenue, Chicago, 100 x 360 ft. Cost close to $300,000 with equipment.

Shasta Union High School District, Redding, Cal., plans vocational department in new junior high school. Cost about $365,000. Special election has been called Sept. 30 to approve bonds for $200,000, remainder of fund to be secured through Federal aid.

Bureau of Reclamation, Denver, Colo., asks bids until Oct. 5 for one 10 ft., with 16-ft. extension, motor-driven, vertical boring mill for installation in Boulder power plant, Boulder Canyon project, Arizona-California-Nevada (Specifications 1126-D); until Oct. 14 for pumping plants Nos. 1, 2, 3 and 4, Contra-Costa Canal, Delta Division, Central Valley project, near Antioch, Cal. (Specifications 803).

Board of Education, Phoenix, Ariz., plans group of one-story vocational shops at new Phoenix junior college, for which bids will be asked soon on general contract. Cost about $600,000. A bond issue of $330,000 has been approved, remainder of fund to be secured through Federal grant. Lescher & Mahoney, Title & Trust Building, are architects.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Oct. 5 for one steam turbine unit of straight condensing type, for connection with existing equipment at power house at Mare Island, Cal., Navy Yard (Specifications 8907).

W. P. Fuller & Co., North 229 Post Street, Spokane, Wash., manufacturer of paints, oils, varnishes, etc., has awarded general contract to Walter Meyers, Hyde Building, for one-story addition, 50 x 142 ft., with foundations for three additional stories at later date, for storage and distribution. Cost over $50,000 with equipment. Rigg & Vantyne, Peyton Building, are architects. Main offices of company are at 301 Mission Street, San Francisco.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Oct. 4 for 900 cylinder valves (Schedule 4453); until Oct. 11 for one electric drive telescope fork-type tiering tilting truck (Schedule 4429); until Oct. 14 for 5000 extractors for 4-in./50-cal. cartridge tanks (Schedule 4444) for Mare Island, Cal., Navy Yard.

FOREIGN

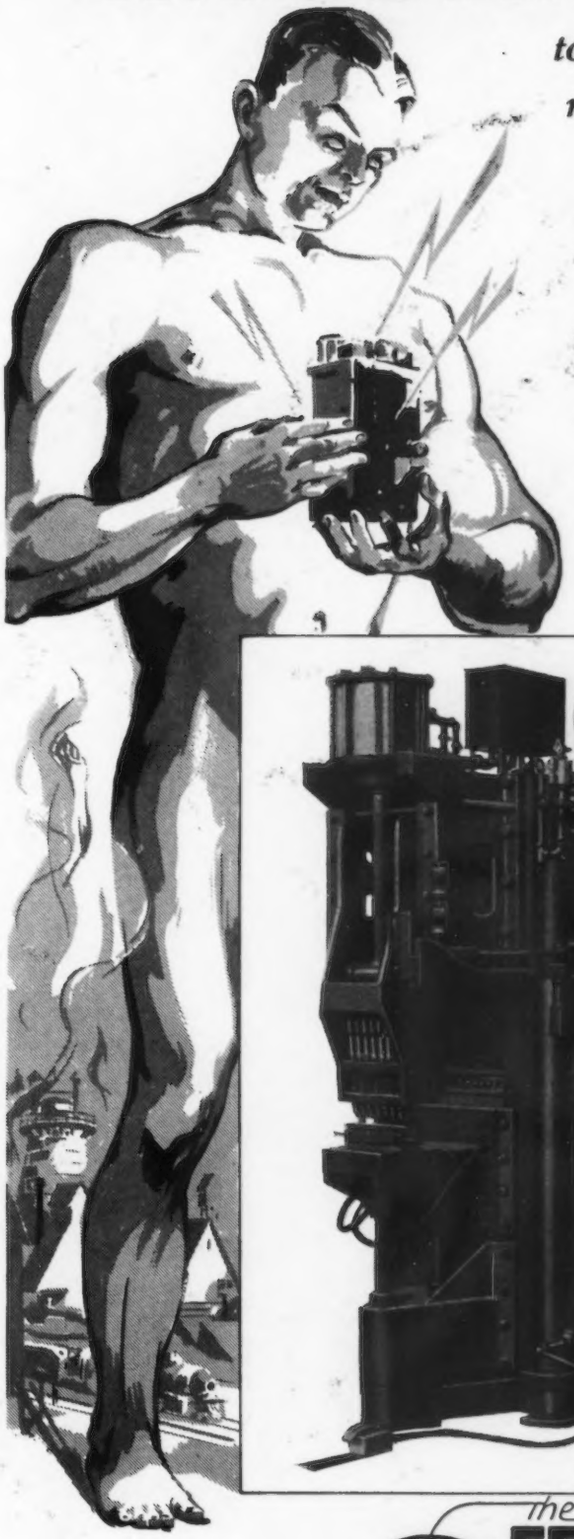
Head, Wrightson & Co., Ltd., Teesdale Iron Works, Thornaby-on-Tees, Lancashire, England, manufacturer of iron and steel products, plans large one-story addition, to be equipped primarily for core production for carbon and special alloy steel castings. Cost over $150,000 with equipment.

General Motors Holdens, Ltd., Sydney, New South Wales, Australia, is arranging for purchase of tract of about 25 acres of land near city as site for new plant for automobile assembling, including parts divisions. It will consist of several one-story units, with facilities for employment of about 500 men. New works will replace present company plant at Marrickville and provide for large increased capacity. Work is scheduled to begin before close of year. Cost over $1,000,000 with equipment.

Always Consider Resistance Welding

INDUSTRY RESPONDS

to Federal's New ULTRA-SPEED *method of* SPOT WELDING

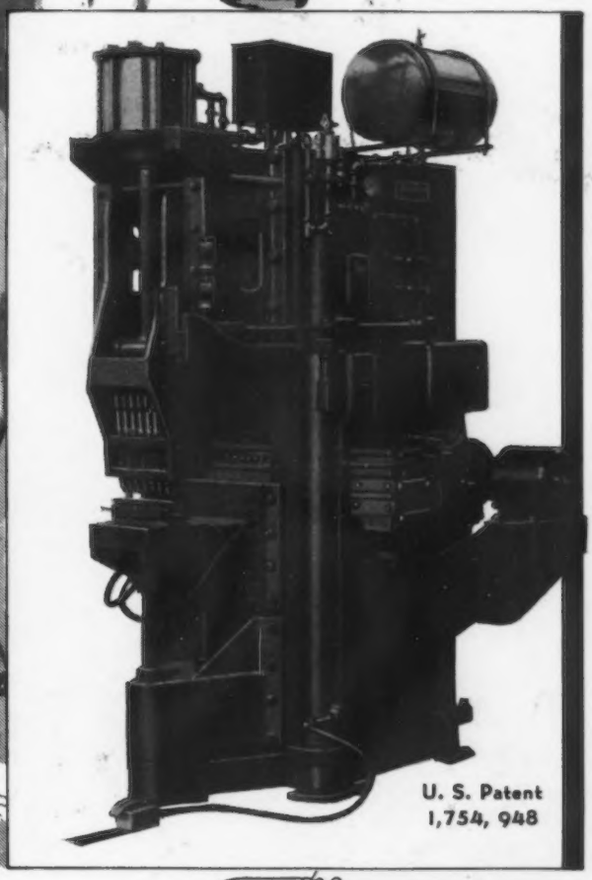


Quick to visualize the possibilities of this new and revolutionary method of resistance welding, many alert and progressive industries are basing new production and price structures on its immediate or early adoption and installation. In ULTRA-SPEED Spot Welders, these industries see new avenues to profit through speedier production, increased efficiency and lower costs.

ULTRA-SPEED Welds are cleaner and of greater strength and uniformity than ever before obtained in production welding. Transformer capacity is small, only one electrode welding at a time. From ten to several hundred electrodes may be incorporated in a single machine, making the number of spot welds practically unlimited. Panels are held in perfect shape as individual electrodes act as hold-down clamps and, to a certain extent, as forming dies. In addition, ULTRA-SPEED Spot Welders are of simple construction, requiring only a minimum of maintenance.

With Federal ULTRA-SPEED Welders in the production line, alert industries will enjoy a distinct advantage over those competitive concerns not so modernly equipped.

Descriptive literature is available. Write for it.



U. S. Patent
1,754, 948

The accompanying illustration shows a Federal Spot Welder, designed with the new ULTRA-SPEED unit to weld flexible ice cube grids at a speed of 6 spots per second. This machine operates 14 spring loaded electrodes by means of a double acting air cylinder. The transformer has a nominal rating of 75 K.V.A. with the secondary circuit water cooled throughout.

the Federal FEDERAL

MACHINE & WELDER CO.

In England, made by British Federal Welder & Machine Co. Ltd., Dudley, England

WARREN, OHIO

SALES OFFICES IN ALL PRINCIPAL CITIES

General view showing battery of Niagara Presses and Shears in the metal working department of one of America's largest Airplane manufacturers.

Photo courtesy of Curtiss Aeroplane Division of Curtiss-Wright Corporation

NIAGARA *Presses and Shears*

IN AIRCRAFT PRODUCTION

The modern design of the complete line of Niagara Presses, Shears and Machines for shearing, blanking, forming and drawing sheet metal is making possible faster production, and worthwhile economies in manufacturing and assembly costs.

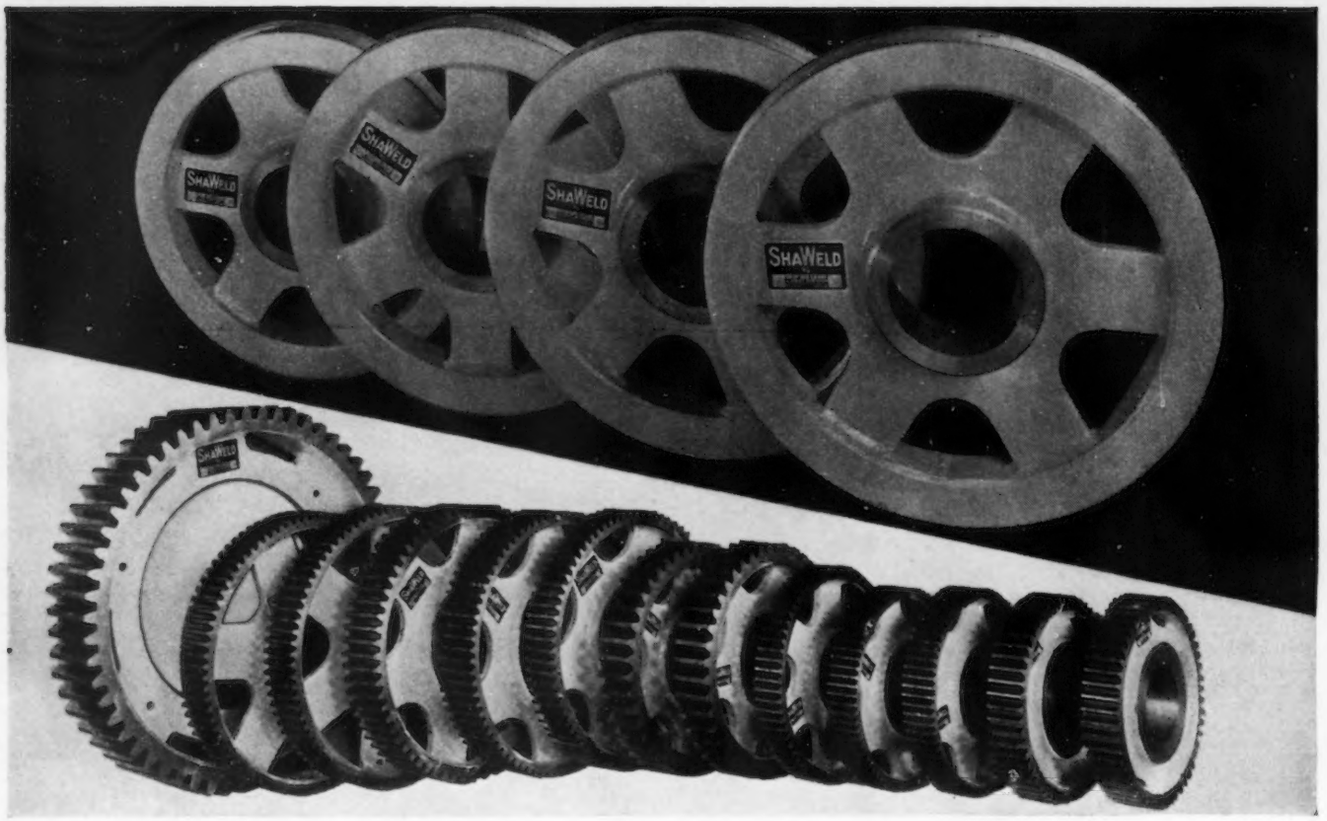
Write for new bulletins illustrating and describing the latest developments and improvements in metal working machines.

NIAGARA

NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y.

Branches: Leader Building, Cleveland; General Motors Building, Detroit; 50 Church Street, New York

PRESSES · SHEARS · MACHINES FOR PLATE AND SHEET METAL WORK



● *ShaWeld gear blanks, finished gears and sheaves of various sizes fabricated by Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc., Muskegon, Mich.*

WHY BUILD GEARS AND SHEAVES BY WELDING?

Here's the answer of one manufacturer:

1. COST IS LOW. Savings of 10% to 25% over former methods of construction.

2. QUALITY IS HIGH. Sections are uniform, homogeneous. Various classes of steels may be used in hubs, webs and rims to suit service requirements.

3. DELIVERY IS QUICK. Blanks such as illustrated above can be produced in a few days. Also, because of uniformity of metal, fast cutting speeds can be employed.

Investigate welded design for profits. There are 60 Lincoln offices located throughout the U. S. in important industrial centers. Each is staffed with experienced welding technicians to advise you on changing over to welded construction. Consult the nearest Lincoln office or mail the coupon.

THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

THE LINCOLN ELECTRIC CO.
Dept. X-536, Cleveland, Ohio
☐ Have your man call (no obligation). ☐ Send free copy of "How to Change Over to Welded Design."

Name _____ Position _____

Company _____

Address _____

City _____ State _____

MR. A. L. EATON, *Gen. Supt., Treadwell Construction Co., Midland, Pa., says—*

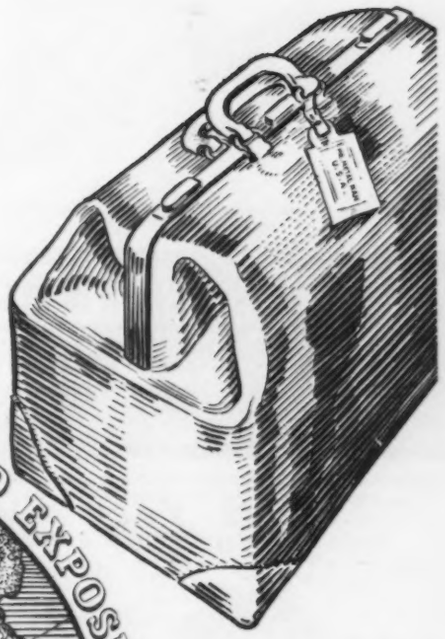
"Since the introduction of electric arc welding in our plant we have increased the efficiency of production materially."

Pack up YOUR QUESTIONS IN YOUR OLD KIT BAG AND BRING THEM TO DETROIT ★ ★ ★ OCTOBER 17-21

What's the big problem facing you in your work?

Does it concern materials . . . or methods . . . or equipment . . . or inspection . . . or testing? No matter. Whatever it is, so long as it concerns metal, bring it with you to National Metal Congress and Exposition and you will be virtually certain to find an answer . . . either in one of the authoritative papers or open sessions of the technical meetings, in informal contact with a man who has already faced the same problem, or in one of the more-than-200 absorbingly interesting exhibits which leading manufacturers are preparing for your study.

Four great technical societies are co-operating to make this, the TWENTIETH Annual Metal Congress and Exposition, the most broadly helpful meeting of its kind ever staged for the Metal Industry. You will be liberally repaid for your investment.



NATIONAL METAL CONGRESS AND EXPOSITION

The WORLD'S GREATEST ANNUAL EVENT IN THE METAL INDUSTRIES

DETROIT 1938

Co-operating Societies:

American Society for Metals

Wire Association

Institute of Metals Division and Iron and Steel Division of A.I.M.E.

American Welding Society

•

More than 52 technical sessions, addressed by nationally recognized authorities.

•

More than 200 exhibits of leading manufacturers.

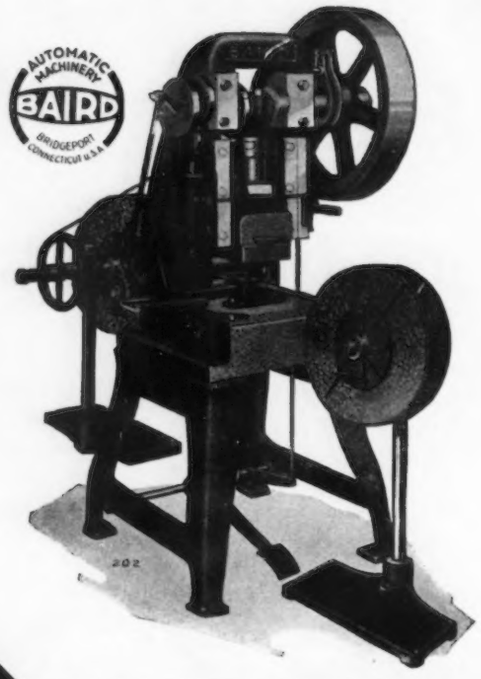
Under the auspices of

AMERICAN SOCIETY FOR METALS

7016 Euclid Ave.

Cleveland Ohio

Combines Automatic Operation with Short Set-Up Time



In the BAIRD Automatic Press we have built a high production machine that is moderate in price and the set-up time in changing over from one attachment to another is surprisingly short.

Thus you can get rapid production and automatic operation on a wide variety of press jobs that will help you to meet competition. Let us show you what this automatic press would do on *your* work.

"Ask BAIRD About It"

THE BAIRD MACHINE CO.
BRIDGEPORT, CONNECTICUT

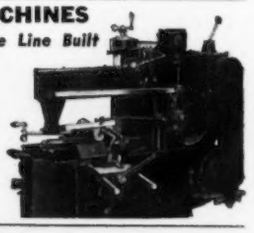
GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Two, Four, Five Spindles • Work and Tool Rotating Types
GOSS & DE LEEUW MACHINE CO., NEW BRITAIN, CONN.

The leading publication in any field is the best advertising medium. In the metal-working industry—it's The Iron Age.

LUCAS "PRECISION"
Horizontal Boring, Drilling and Milling Machine
THE LUCAS MACHINE TOOL CO.
NOW AND ALWAYS OF
CLEVELAND, OHIO, U.S.A.

LELAND-GIFFORD COMPANY
Worcester, Mass.
Drilling Machinery
Belt and Motor Spindle
One to Six Spindles
Tapping Attachments and Multiple Heads

MARVEL SAWING MACHINES
The Most Complete Line Built
MARVEL provides a better saw for every job; small shop saws, low priced Speed Saws, heavy duty, all ball bearing High Speed Sawing Machines, Automatic production Saws, a universal metal-cutting Band Saw and a giant Hydraulic. Write for Bulletin.
ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5749 Bloomingdale Ave., Chicago, Ill., U. S. A.



HOLCROFT & COMPANY
LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA
CANADA: WALKER METAL PRODUCTS, LTD., WALKERVILLE, ONT.
BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

PRODUCTS INDEX

WHO MAKES IT

Here you find a weekly listing of hundreds of products with the names and addresses of manufacturers. The advertisements of these companies appear in The Iron Age.

ABRASIVE WHEELS — See Grinding Wheels

ABRASIVE CLOTH & PAPER
Norton Co., Worcester, Mass.

ABRASIVES—Steel Shot and Grit
Harrison Abrasive Corp., Manchester, N. H.
Pittsburgh (Pa.) Crushed Steel Co.

ACCESSORIES—Welding
Lincoln Electric Co., The, Cleveland.

ACCUMULATORS—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Hydraulik Gmbh, Duisburg, Germany.
Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
Wood, R. D., & Co., Philadelphia.

ACETYLENE—Dissolved in Cylinders & Small Tanks
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

ACID-PROOF CEMENT
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

ACIDS—Pickling
American Chemical Paint Co., Ambler, Pa.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

AIR CONDITIONING EQUIPMENT
American Blower Corp., 6000 Russell St., Detroit, Mich.

AIR TANKS AND CYLINDERS
Scaife, William B., & Sons Co., Ptgh.

AIRMETERS & VOLTMETERS
Weston Electrical Instrument Corp., Newark, N. J.

ALLOYS—Copper
American Brass Co., The, Waterbury, Conn.

ALLOYS—Ferro
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

ALLOYS—Magnesium
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ALLOYS—Phosphor Bronze
Phosphor Bronze Smelting Co., The, Phila.

ALLOYS—Titanium
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

ALLOYS—Zinc Base Die Casting
Gardiner Metal Co., 4884 S. Campbell Ave., Chicago.
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ALUMINUM
Aluminum Co. of America, Pittsburgh.

AMMETERS AND VOLTMETERS—Recording
Leeds & Northrup Co., Philadelphia.

AMMONIA RECOVERY PLANTS
Koppers Co., Pittsburgh.

ANGLES, BEAMS, CHANNELS AND TEES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.

ANGLES, BEAMS, CHANNELS & TEES—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ANNEALING—See Heat Treating

ANNEALING BOXES
United Engineering & Fdry. Co., Ptgh.

ANNEALING COVERS
Continental Roll & Steel Fdry. Co., East Chicago, Ind.

ANODES—Lead
National Lead Co., 111 Bdway., N. Y. C.

APPAREL—Welding
Lincoln Electric Co., The, Cleveland.

ARBORS
Cincinnati (Ohio) Milling Mch. Co., The.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

ARMORING MACHINERY—Cable, Wire, Hose
Sleeper & Hartley, Inc., Worcester, Mass.

ARRESTERS—Spark
Harrington & King Perforating Co., Chicago.

ASSEMBLIES—Precision, Production
Peco Manufacturing Corp., Philadelphia.

AXLES—Car or Locomotive
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BABBITT METALS
Bunting Brass & Bronze Co., The, Toledo, Ohio.
Cramp Brass & Iron Foundries Co., Philadelphia.
Gardiner Metal Co., 4884 S. Campbell Ave., Chicago.
National Lead Co., 111 Bdway., N. Y. C.

BALING PRESSES—Scrap — See Presses—Baling

BALLS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Hartford (Conn.) Steel Ball Co., The.

BALLS—Steel, Brass or Bronze
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Hartford (Conn.) Steel Ball Co., The.
New Departure Div., General Motors Corp., Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Strom Steel Ball Co., Cicero, Ill.

BANDS—Steel
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BARRELS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.

BARRELS—Tumbling
Baird Mch. Co., The, Bridgeport, Conn.
Hartford (Conn.) Steel Ball Co., The.
Whiting Corp., Harvey, Ill.

BARS—Alloy
Midvale Co., The, Nicetown, Phila., Pa.
Republic Steel Corp., Cleveland, Ohio.

BARS—Aluminum
Aluminum Co. of America, Pittsburgh.

BARS—Brass, Bronze or Copper
Bunting Brass & Bronze Co., Toledo, Ohio.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

BARS—Cold Drawn
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Jones & Laughlin Steel Corp., Pittsburgh.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

BARS—Concrete, Reinforcing
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Laclede Steel Co., St. Louis, Mo.
Nicetown Plate Washer Co., Inc., Philadelphia.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BARS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

BARS—Rustless
Midvale Co., The, Nicetown, Phila., Pa.
Rustless Iron & Steel Corp., Baltimore, Md.

BARS—Steel
Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

BASKETS—Pickling & Dipping
Cambridge (Md.) Wire Cloth Co.

BATTERIES—Storage
Electric Storage Battery Co., The, Phila.

BATTERY CHARGERS
Cutler-Hammer, Inc., Milwaukee.

BEAMS—See Angles, Beams, Channels and Tees

BEARINGS—Babbitt
Bunting Brass & Bronze Co., The, Toledo, Ohio.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

BEARINGS—Ball
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., Poughkeepsie, N. Y.

BEARINGS, Brass and Bronze
Ampco Metal, Inc., Milwaukee, Wisc.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
National Bearing Metals Corp., Pittsburgh.

BEARINGS—Oilless
Bunting Brass & Bronze Co., Toledo, O.
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

BEARINGS—Radial
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

BEARINGS—Roll Neck
Morgan Construction Co., Worcester, Mass.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton O.

BEARINGS—Roller
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller Tapered
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Shaft Hanger
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BEARINGS—Thrust
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Timken Roller Bearing Co., The, Canton, O.

BELT—Conveyor, Elevator
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTING—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

BELTING—Metal, Conveyor, High and Low Temperature
Cambridge (Md.) Wire Cloth Co.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

BELTING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTS—V-Type
Allis-Chalmers Mfg. Co., Milwaukee.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BENDING MACHINES—Hand, Band and Angle
Excelsior Tool & Mch. Co., E. St. Louis, Ill.

BENDING MACHINES—Hand and Power
Buffalo (N. Y.) Forge Co., 492 Broadway.
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Niagara Machine & Tool Works, Buffalo, N. Y.

BENZOL RECOVERY PLANTS
Koppers Co., Pittsburgh.

BERYLLIUM COPPER
American Brass Co., The, Waterbury, Conn.

BILLETS—Alloy
Harrisburg (Pa.) Steel Corp.
Midvale Co., The, Nicetown, Phila., Pa.

BILLETS—Carbon
Harrisburg (Pa.) Steel Corp.

BILLETS—Chrome Nickel Steel
Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Chrome Steel
Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Forging
Alan Wood Steel Co., Conshohocken, Pa.
Harrisburg (Pa.) Steel Corp.
Republic Steel Corp., Cleveland, Ohio.

BILLETS—Re-rolling
Alan Wood Steel Co., Conshohocken, Pa.

BILLETS—Steel
Bethelhem (Pa.) Steel Company.
Continental Steel Corp., Kokomo, Ind.
Harrisburg (Pa.) Steel Corp.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BLANKS—Chisel
Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, Ohio.

BLANKS—Gear and Pinion
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

BLAST CLEANING EQUIPMENT
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.

BLAST FURNACES
Brassert, H. A., & Co., Chicago, Ill.

JUST BETWEEN US TWO

Wanted: Hair and Annealer

With our bald spot growing by geometrical progression, it is only a matter of time before we conquer our native timidity and ask "Whitey" Maurath how he keeps that wonderful crop of hair. He will probably answer, "Exercise your head," which will be no help at all.

"Whitey," as it is hardly necessary to say, is chief of Maurath, Inc., Cleveland, welding electrodes. His right hand man, Miss Phyllis M. Yarans, tells us that a reader inquired the other day if "Whitey" would build him an electric annealer like the one in a recent Maurath ad.

The gentleman with the luxuriant locks designed and built the annealer for his own use, as he did practically all of his equipment, and very likely he gave the inquirer the same answer he would give us.

Hot Blast from Windy City

"S.W.," Chicago's angry man, who berates us anonymously and regularly because our liberalism is no match for his, is in again. He satirizes:

> "If you could only get Chamberlain for the *'Salesman Wanted to Sell Facts to American Workers'* in the Sept. 15 issue! He'd be ideal for the job."

He didn't like anything in the issue, but flatters us by marking this column as "most nearly bearable."

As an antidote to "S.W.'s" diatribe we re-read the untrammelled statement of a Motor Wheel Corp., Lansing, Mich., executive, who says:

"In my opinion it is the best magazine published."

History Makes a Carbon Copy

John B. B. Douglas of Westfield, N. J., says he has been reading The Iron Age for 53 years. The habit has gotten the better of him, so that a Thursday without this journal is, he says, lacking in interest.

To see what kind of a paper they were getting out in those days we looked up the back files. We couldn't find anything around 1885, when Mr. Douglas joined the one, big more or less happy family, but we did locate a copy of 17 years earlier—Aug. 6, 1868—from which we pulled this plum:

> ". . . the question is, does he (the emperor of France), in his present situation, believe in the possibility of being able to avoid the combat for any length of time? He knows too well that the French reproach him with having, through his reserved, and at the same time irresolute policy, contributed more than any one to the formation of the new Germany, that now gives them so much uneasiness."

Their Guard Never Drops

Printers, as a race, have highly sensitive protective reflexes. They can cover up faster than an English heavyweight. Their attitude toward complaints is (1) there is no cause for complaint, and (2) if there is it is unimportant.

In the matter of the alleged peculiar odor of freshly printed copies of your fragrant family journal, we haven't yet gotten by the first barrier with Harry Duffy, our printing superintendent. He writes airily:

> *"Ink has always had a certain amount of odor to it, but in the last couple of years the odor has changed. It is not any stronger than it ever was, but it is like changing from lilacs to roses."*

You can tell by that that Mr. Duffy is not lying awake nights debating whether the girls who attend the collating machine should be equipped with atomizers or whether Christmas Night should be squirted right into the ink, and that it is of little importance to him when the ink makers get their pretty heads together and decide to change from rose to heliotrope.

Even though a permanent cold in the head prevents us from having a personal interest in the matter, Mr. Duffy's *dolce far niente* attitude suits us not at all. You will hear more of this.

Puzzles

The man in last week's puzzle is now 43. His wife is 36 and they have been married 18 years. We couldn't figure it out. The inmate in the next cell to ours got it by juggling, but we still don't know the formula.

Try this one the hard way:

> *If it is now 4:12 in how many minutes will the minute hand be exactly over the hour hand?*

—A. H. D.

PRODUCTS INDEX

BLAST GATES
Rockwell, W. S., Co., 50 Church St.,N.Y.C.

BLOCKS—Chain
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

BLOWERS
American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., 6000 Russell St., Detroit, Mich.
Buffalo (N. Y.) Forge Co., 492 Broadway.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

BLOWERS—Rotary & Centrifugal
Roots-Connersville Blower Corp., Connersville, Ind.

BLOWPIPES—Oxy-Acetylene Welding & Cutting
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

BLOWPIPES — Soldering, Heating, Annealing
American Gas Furnace Co., Elizabeth, N.J.

BOILERS
Munroe R., & Sons Mfg. Corp., Pittsburgh.

BOILERS—Waste Heat
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS—Water Tube
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOLT CUTTERS
Landis Mch. Co., Inc., Waynesboro, Pa.

BOLT AND NUT MACHINERY
Ajax Mfg. Co., The, Euclid, Ohio.
Landis Machine Co., Inc., Waynesboro, Pa.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

BOLT & RIVET CLIPPERS
Helwig Mfg. Co., St. Paul, Minn.

BOLTS—Carriage and Machine
Erie (Pa.) Bolt & Nut Co.
Lamson & Sessions Co., The, Cleveland.
Oliver Iron & Steel Corp., Pittsburgh.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special
Erie (Pa.) Bolt & Nut Co.
Lamson & Sessions Co., The, Cleveland.
Oliver Iron & Steel Corp., Pittsburgh.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special, Hot or Cold Upset
Lamson & Sessions Co., The, Cleveland.
Oliver Iron & Steel Corp., Pittsburgh.

BOLTS—Stove
Lamson & Sessions Co., The, Cleveland.
Progressive Mfg. Co., Torrington, Conn.

BOLTS—Stove, Recessed Head
American Screw Co., Providence, R. I.

BOLTS—Track
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BOLTS AND NUTS
American Screw Co., Providence, R. I.
Clark Bros. Bolt Co., Millidale, Conn.
Erie (Pa.) Bolt & Nut Co.
Lamson & Sessions Co., The, Cleveland.
Oliver Iron & Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS AND NUTS—Self Locking
Lamson & Sessions Co., The, Cleveland.

BOND—Grinding Wheel
Bakelite Corp., 247 Park Ave., N. Y. C.

BORING, DRILLING & MILLING MACHINES—Horizontal
Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.
Lucas Machine Tool Co., Cleveland.
National Automatic Tool Co., Richmond Ind.

BORING & DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.

BORING MACHINES—Jig
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

BORING & TURNING MILLS—Vertical
Cincinnati (Ohio) Planer Co.
Rogers Machine Wks., Alfred, New York.

BRAKE LINING AND BLOCKS—Asbestos
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BRAKES—Electric
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.

BRAKES—Electric & Mechanical
Clark Controller Co., The, Cleveland.
Electric Controller & Mfg. Co., The, Cleveland.

BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

BRAKES—Metal Forming
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Steelweld Machinery Co., Cleveland.

BRICK—Acid Resisting
Keagler Brick Co., Steubenville, Ohio.

BRICK—Fire Clay
Carborundum Co., The, Niagara Falls, N. Y.
Keagler Brick Co., Steubenville, Ohio.

BRICK—Insulating
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BRIDGE BUILDERS
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Belmont Iron Works, Philadelphia.

BRIDGE OPERATING MACHINERY—Movable
Earle Gear & Mch. Co., Philadelphia.

BRIQUETS—Ferroalloy
Electro Metallurgical Sales Corp., 80 East 42nd St., N. Y. C.

BROACHES
Colonial Broach Co., Detroit.

BROACHING MACHINES
Cincinnati (Ohio) Milling Mch. Co., The.
Colonial Broach Co., Detroit.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

BRONZE FOR DIES
Ampco Metal, Inc., Milwaukee, Wisc.

BRONZE—Phosphor
Bunting Brass & Bronze Co., Toledo, Ohio.
Phosphor Bronze Smelting Co., The, Phila.

BUCKETS—Clamshell
Blaw-Knox Co., Pittsburgh.
Hayward Co., The, 50 Church St.,N. Y. C.
Industrial Brownhoist Corp., Bay City, Mich.

BUCKETS—Electric Motor
Hayward Co., The, 50 Church St.,N. Y. C.

BUCKETS—Orange Peel
Hayward Co., The, 50 Church St.,N. Y. C.

BUFFERS & POLISHING MACHINES
Packer Machine Co., The, Meriden, Conn.

BUFFING APPLICATORS—Automatic
Packer Machine Co., The, Meriden, Conn.

BUILDINGS—Steel
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Belmont Iron Works, Philadelphia.
Blaw-Knox Co., Pittsburgh.
Iron & Steel Products, Inc., Chicago.

BULLDOZERS
Ajax Mfg. Co., The, Euclid, Ohio.
Steelweld Machinery Co., Cleveland.

BURNERS—Oil or Gas
Kemp, C. M., Mfg. Co., The, Baltimore, Md.

BUSHINGS—Bronze
Ampco Metal, Inc., Milwaukee, Wisc.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
Phosphor Bronze Smelting Co., The, Phila.
Shenango-Penn Mold Co., Dover, Ohio.

BUSHINGS—Oilless
Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.

BUSHINGS—Phosphor Bronze
Bunting Brass & Bronze Co., Toledo, Ohio.
Phosphor Bronze Smelting Co., The, Phila.

BY-PRODUCTS COKE AND GAS OVENS
Koppers Co., Pittsburgh.

CABLE—Electric
General Electric Co., Schenectady, N. Y
Lincoln Electric Co., The, Cleveland.

CABLEWAYS AND TRAMWAYS—See Tramways

CALCIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CARBIC
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

CARRIDE
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

PRODUCTS INDEX

CARBIDE—Boron
Norton Co., Worcester, Mass.

CARBURIZING—See Heat Treating

CARS—Railway
Iron & Steel Products, Inc., Chicago.

CARS—Industrial and Mining
Atlas Car & Mfg. Co., The, Cleveland.

CASE HARDENING—See Heat Treating

CASTINGS—Acid or Heat Resisting
Ampco Metal, Inc., Milwaukee, Wisc.
Cramp Brass & Iron Foundries Co., Philadelphia.
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
Hoskins Mfg. Co., Detroit, Mich.
Jewell Alloy & Malleable Co., Inc., 173 Hertel Ave., Buffalo, N. Y.
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Forging & Casting Corp., The, Ferndale, Mich.
Western Foundry Co., Chicago.

CASTINGS—Alloy Steel
Advance Foundry Co., The, Dayton, Ohio.
Hartford (Conn.) Electric Steel Corp.
Mackintosh-Hemphill Co., Pittsburgh.

CASTINGS—Aluminum
Aluminum Co. of America, Pittsburgh.
Fairmount Foundry, Inc., Phila., Pa.
Frontier Bronze Corp., 818 Ellwood Ave., Niagara Falls, N. Y.

CASTINGS—Brass, Bronze, Copper or Aluminum
Bunting Brass & Bronze Co., The, Toledo, Ohio.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Cramp Brass & Iron Foundries Co., Philadelphia.
Frontier Bronze Corp., 818 Ellwood Ave., Niagara Falls, N. Y.
National Bearing Metals Corp., Pittsburgh.
Phosphor Bronze Smelting Co., The, Phila.
Snyder, W. P., & Co., Pittsburgh.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—Corrosion Resisting
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Die, Aluminum
Aluminum Co. of America, Pittsburgh.

CASTINGS—Electric Steel
Crucible Steel Castings Co., Lansdowne, Pa.

CASTINGS—Gray Iron
Advance Foundry Co., The, Dayton, Ohio.
American Engineering Co., Philadelphia.
Chambersburg (Pa.) Engineering Co.
Commercial Steel Casting Co., Marion Ohio.
Cramp Brass & Iron Foundries Co., Philadelphia.
Fairmount Foundry, Inc., Phila., Pa.
Murray Iron Wks. Co., Burlington, Iowa.
National Roll & Fdry. Co., Avonmore, Pa.
North Wales (Pa.) Mach. Co., Inc.
Spencer's, I. S., Sons, Inc., Guilford, Ct.
Western Foundry Co., Chicago.

CASTINGS—High Test & Alloy Iron
Cramp Brass & Iron Foundries Co., Philadelphia.
Meehanite Metal Corp., Pittsburgh.
Western Foundry Co., Chicago.

CASTINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

CASTINGS—Malleable
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Jewell Alloy & Malleable Co., Inc., 173 Hertel Ave., Buffalo, N. Y.
Lake City Malleable Co., The, 5100 Lakeside Ave., Cleveland.
Malleable Iron Fittings Co., Branford, Ct.
Peoria (Ill.) Malleable Castings Co.

CASTINGS—Meehanite Metal
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Monel & Nickel
Cramp Brass & Iron Foundries Co., Philadelphia.
Frontier Bronze Corp., 818 Ellwood Ave., Niagara Falls, N. Y.
Superior Bronze Corp., Erie, Pa.

CASTINGS—Semi-Steel
Cramp Brass & Iron Foundries Co., Philadelphia.
Malleable Iron Fittings Co., Branford, Ct.

CASTINGS—Steel
Bethlehem (Pa.) Steel Company.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh, & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Commercial Steel Casting Co., Marion, Ohio.
Crucible Steel Castings Co., Lansdowne, Pa.
Hartford (Conn.) Electric Steel Corp.
Jewell Alloy & Malleable Co., Inc., 173 Hertel Ave., Buffalo, N. Y.
Mackintosh-Hemphill Co., Pittsburgh.
Malleable Iron Fittings Co., Branford, Ct.
Mesta Mch. Co., Pittsburgh.
Standard Steel Wks. Co., Burnham, Pa.
Strong Steel Foundry Co., Buffalo, N. Y.

CASTINGS—Wear Resisting
Meehanite Metal Corp., Pittsburgh.
Western Foundry Co., Chicago.

CEMENT—Acid-Proof
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CEMENT—Refractory
Carborundum Co., The, Perth Amboy, N. J.
Johns-Manville Corp., 22 East 40th St., New York City.

CEMENT—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

CHAINS—Conveyor & Elevator
Baldwin-Duckworth Chain Corp., Springfield, Mass.

CHAINS—Power Transmission
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Ramsey Chain Co., Inc., Albany, N. Y.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Roller
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Silent
Ramsey Chain Co., Inc., Albany, N. Y.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHANNELS—See Angles, Beams, Channels and Tees

CHECKS—Metal
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

CHEMICALS—Industrial
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CHEMICALS—Rust Proofing
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Parkin, William M., Co., Pittsburgh.

CHROMIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CHUCKING MACHINES—Multiple Spindle
Baird Mch. Co., The, Bridgeport, Conn.
Goss & DeLeeuw Machine Co., New Britain, Conn.
National Acme Co., The, Cleveland.
Potter & Johnston Machine Co., Pawtucket, R. I.

CHUCKS—Air Operated
Hannifin Mfg. Co., Chicago.

CHUCKS—Drill
Cleveland (Ohio) Twist Drill Co., The.
Cushman Chuck Co., Hartford, Conn.
Morse Twist Drill & Mach. Co., New Bedford, Mass.

CHUCKS—Drill, Quick Change
Apex Machine & Tool Co., The, Dayton, Ohio.

CHUCKS—Electric
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Lathe
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Magnetic
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

CHUCKS—Tapping
Apex Machine & Tool Co., The, Dayton, Ohio.

CIRCLES—Phosphor Bronze
Phosphor Bronze Smelting Co., The, Phila.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Ford, J. B., Co., The, Wyandotte, Mich.
Pennsylvania Salt Mfg. Co., Phila., Pa.

CLEANING COMPOUNDS—Alkali
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CLUTCH-BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Fairbanks, Morse & Co., Chicago.
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Medart Co., The, St. Louis, Mo.

CLUTCHES—Magnetic
Cutler-Hammer, Inc., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

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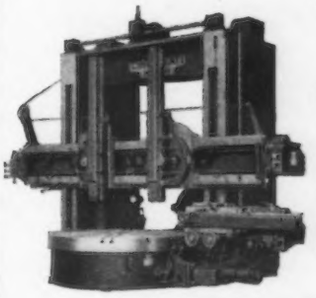

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Joseph P. Binns, Manager
ATLANTIC CITY

PRODUCTS INDEX

COAL
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Koppers Coal Co., Inc., The, Pittsburgh.

COAL SYSTEMS—Pulverized
Holbeck Engineering Co., Detroit.

COBALT METAL
Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Lead
National Lead Co., 111 Bdway., N. Y. C.

COILS—Pipe
Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., The, Cleveland.
Koppers Co., Pittsburgh.

COKE OVENS—By-Products
Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators
Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products
Koppers Co., Pittsburgh.

COLLETS—Drill
Apex Machine & Tool Co., The, Dayton Ohio.

COLUMBIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

COMBUSTION CONTROLS
Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.

COMPOUNDS—Drawing
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSORS—Air
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.
Worthington Pump &. Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONDENSERS—Surface & Jet
Ingersoll-Rand Co., 11 Broadway, N.Y.C.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

CONDUITS—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

CONTRACTORS' SUPPLIES — Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature
Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.

CONTROLLERS—Electric
Clark Controller Co., The, Cleveland
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.
General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated
Cutler-Hammer, Inc., Milwaukee.
Leeds & Northrup Co., Philadelphia.
Vickers, Inc., 1420 Oakman Blvd., Detroit.

CONVEYING AND ELEVATING MACHINERY
Farquhar, A. B., Co., Ltd., York, Pa.
Logan Co., Inc., Louisville, Ky.

CONVEYOR WORMS
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Gravity
Logan Co., Inc., Louisville, Ky.

CONVEYORS—Monorail
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable
Farquhar, A. B., Co., Ltd., York, Pa.

COOLING SYSTEMS—Water
Marley Co., The, Kansas City, Kansas.

COPING MACHINES
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL
Penola, Inc., Pittsburgh.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS — See Grinding Wheels

COTTERS AND KEYS—Spring
Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lamson & Sessions Co., The, Cleveland.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES
Cleveland (Ohio) Twist Drill Co., The.
Gairing Tool Co., Detroit.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production
Veeder-Root, Inc., Hartford, Ct.

COUNTING MACHINES
Veeder-Root, Inc., Hartford, Conn.

COUPLINGS—Flexible
Lovejoy Flexible Coupling Co., Chicago.
Poole Foundry & Mch. Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.

COUPLINGS—Pipe
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

CRANES—Crawling Tractor
American Hoist & Derrick Co., St. Paul, Minn.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES — Electric, Industrial, Truck Mounted
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling
Armel, James P., Pittsburgh.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Maris Brothers, Inc., Philadelphia.
Morgan Engineering Co., The, Alliance, O.
Northern Engineering Works, Detroit, Mich.
Reading (Pa.) Chain & Block Corp.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES—Gantry
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Whiting Corp., Harvey, Ill.

CRANES—Hand Power
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Maris Brothers, Inc., Philadelphia.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Whiting Corp., Harvey, Ill.

CRANES—Jib
Cleveland Tramrail Div. of the Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Euclid Crane & Hoist Co., The, Euclid, O.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

CRANES—Locomotive
American Hoist & Derrick Co., St. Paul, Minn.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, O.

CRANES—Monorail
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Reading (Pa.) Chain & Block Corp.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

CRANES—Portable
Canton Fdry. & Mch. Co., Cleveland.

CRANES—Portable Electric
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANKSHAFTS
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

CRANKSHAFTS—Forged
Bay City Forge Co., Erie, Pa.
Midvale Co., The, Nicetown, Phila., Pa.

CUTTERS—Die Sinking
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Tomkins-Johnson Co., The, Jackson, Mich.

CUTTERS—Keyseating
Davis Keyseater Co., 400 Exchange St. Rochester, N. Y.

CUTTERS—Milling
Barber-Colman Co., Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland (Ohio) Twist Drill Co., The.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Victor Machinery Exchange, 251 Centre St., N. Y. C.

CUTTING-OFF MACHINES—Abrasives
Tabor Mfg. Co., Phila.

CUTTING-OFF MACHINES—Cold Saw
Espen-Lucas Mch. Wks., Philadelphia.

CUTTING-OFF MACHINES—Pipe or Tubing
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Bardons & Oliver, Cleveland.
Cox & Sons Co., The, Bridgeton, N. J.
Landis Mch. Co., Inc., Waynesboro, Pa.

CUTTING AND WELDING APPARATUS —Oxy-Acetylene—See Welding and Cutting Machines and Equipment—Oxy-Acetylene.

CYLINDERS — Compressed Air & Hydraulic
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Tomkins-Johnson Co., The, Jackson, Mich.

CYLINDERS—Seamless
Harrisburg (Pa.) Steel Corp.
Midvale Co., The, Nicetown, Phila., Pa.
National Tube Co. (U. S. Steel Corp Subsidiary), Pittsburgh.

DEGREASING COMPOUNDS
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

DIAMOND TOOLS
Bausch & Lomb Optical Co., Rochester, N. Y.

DIE BLOCKS—Drop Hammer
Heppenstall Co., Pittsburgh.

DIE SINKING MACHINES — Automatic and Hand
Cincinnati (Ohio) Milling Mch. Co., The.
Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

DIE STOCKS
Ridge Tool Co., Elyria, Ohio.

DIES, JIGS, FIXTURES, etc.
Atlantic Mfg. Co., Philadelphia.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

DIES—Cast Tool Steel
Advance Foundry Co., The, Dayton, Ohio.
Forging & Casting Corp., The, Ferndale, Mich.

DIES—Pipe Threading
Landis Mch. Co., Inc., Waynesboro, Pa.
National Acme Co., The, Cleveland.

DIES—Screw and Thread Cutting
Eastern Mach. Screw Corp., New Haven, Ct.
Geometric Tool Co., The, New Haven, Conn.
Greenfield (Mass.) Tap & Die Corp.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
National Acme Co., The, Cleveland.

DIES—Self-Opening Adjustable
Eastern Mach. Screw Corp., New Haven, Ct.
Geometric Tool Co., The, New Haven, Conn.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
National Acme Co., The, Cleveland.

DIES—Sheet Metal Working
Ferracute Machine Co., Bridgeton, New Jersey.
Worcester (Mass.) Stamped Metal Co., 6 Hunt St.

DIES—Steel Letters and Stamps
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

DOORS & SHUTTERS, Fireproof
Kinnear Mfg. Co., Columbus, Ohio.

DOORS & SHUTTERS—Steel or Wood Rolling
Kinnear Mfg. Co., Columbus, Ohio.

DRAWN WORK—Metal—See Stampings or Drawings—Metal

DRILL HEADS—Hydraulic
National Automatic Tool Co., Richmond, Ind.

DRILL HEADS—Multiple
Baker Bros., Inc., Toledo, Ohio.

DRILLING MACHINES—Bench
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Heavy Duty
Baker Bros., Inc., Toledo, Ohio.

DRILLING MACHINES—Multiple Spindle
Baker Bros., Inc., Toledo, Ohio.
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spindle Adjustable
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spindle Horizontal
Baker Bros., Inc., Toledo, Ohio.
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Portable Electric
Millers Falls Co., Greenfield, Mass.

DRILLING MACHINES—Portable Pneumatic
Helwig Mfg. Co., St. Paul, Minn.
Ingersoll-Rand Co., 11 Broadway, New York City.
Warner & Swasey Co., The, Cleveland.

DRILLING MACHINES—Radial
Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Sensitive
Buffalo (N. Y.) Forge Co., 492 Broadway.
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Upright
Baker Bros., Inc., Toledo, Ohio.
Buffalo (N. Y.) Forge Co., 492 Broadway.
Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.
Cincinnati (Ohio) Bickford Tool Co., The.

DRIVES—Gear
Farrel-Birmingham Co., Inc., Buffalo, N. Y.
Mesta Mch. Co., Pittsburgh.

DRIVES—Single & Multiple V-Belts
Allis-Chalmers Mfg. Co., Milwaukee.

DROP FORGINGS—See Forgings—Drop, Iron or Steel

DROP HAMMERS—See Hammers—Drop

DUST COLLECTORS
Abrasive Machine Tool Co., East Providence, R. I.
American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., 6000 Russell St., Detroit, Mich.
American Foundry Equipment Co., The, 401 Bykrit St., Mishawaka, Ind.
Blaw-Knox Co., Pittsburgh.
Whiting Corp., Harvey, Ill.

ECONOMIZERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

ELECTRIC LIGHTING—Industrial
General Electric Co., Cleveland.
General Electric Vapor Lamp Co., Hoboken, N. J.

ELECTRIC WELDING — See Welding — Electric

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee.
General Electric Co., Schenectady, N. Y.

ELECTRICAL MACHINERY — Second Hand. (See Clearing House Section)

ELECTRICAL WIRES
Roebling's, John A., Sons Co., Trenton, N. J.

ELECTRODE HOLDERS—Welding
Lincoln Electric Co., The, Cleveland.

ELECTRODES—Welding, Coated
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Maurath, Inc., 7400 Union Ave., Cleveland.

PRODUCTS INDEX

EMERY WHEELS—See Grinding Wheels

ENGINEERS—Consulting and Industrial
Hunt, C. H., Pittsburgh, Pa.
Koppers Co., Pittsburgh.

ENGINES—Diesel
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Gas
Fairbanks, Morse & Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Oil
Worthington Pump & Machinery Corp., Harrison, N. J.

EYELET MACHINES
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

FACERS—Spot
Gairing Tool Co., Detroit.

FACING CLAY
Carborundum Co., The, Perth Amboy, N.J.

FACTORY & PLANT SITES
Zoll, Edward H., Inc., 196 Market St. Newark, N. J.

FANS—Cooling
South Bend (Ind.) Air Products, Inc.

FANS—Ventilating
American Blower Corp., 6000 Russell St., Detroit, Mich.
Buffalo (N. Y.) Forge Co., 492 Broadway.
South Bend (Ind.) Air Products, Inc.

FEED WATER HEATERS AND PURIFIERS
Harrisburg (Pa.) Steel Corp.

FEEDS—Hydraulic, for Machines
American Engineering Co., Philadelphia.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

FELT—Wool Mechanical
American Felt Co.,315 Fourth Ave.,N.Y.C.

FENCING—Wire
Pittsburgh (Pa.) Steel Co.

FERROALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Samuel, Frank, & Co., Inc., Philadelphia.

FERROMANGANESE
Bethlehem (Pa.) Steel Co.
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Samuel, Frank & Co., Inc., Philadelphia.

FERROSILICO MANGANESE
Ohio Ferro-Alloys Corp., Canton, Ohio.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
Samuel, Frank, & Co., Inc., Philadelphia.

FERROSPIEGELEISEN
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

FERROTITANIUM
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E 42nd St., N. Y. C.

FIBRE
Corning Glass Works, Fibre Products Div. Corning, N. Y.

FILES & RASPS
Disston, Henry, & Sons, Inc., Philadelphia.
Nicholson File Co., Providence, R. I.

FILING MACHINES
Continental Machine Specialties, Inc., Minneapolis, Minn.

FILTER CLOTH—Asbestos
Johns-Manville Corp., 22 East 40th St., New York City.

FILTER CLOTH—Metallic
Cambridge (Md.) Wire Cloth Co.

FILTERS—Air
American Air Filter Co., Inc., Louisville, Ky.

FILTERS—Oil
Cuno Engineering Corp., Meriden, Conn.
National Acme Co., The, Cleveland.

FILTERS—Pressure or Gravity
Scaife, Wm. B., & Sons Co., Pittsburgh.

FIRE BRICK—Insulating
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

FIRE CLAY
Carborundum Co., The, Perth Amboy, N. J.
Keagler Brick Co., Steubenville, Ohio.

FITTINGS—Brass, Pipe and Tube
Commonwealth Brass Corp., Detroit.

FIXTURES—For Machine Tools
Knu-Vise Products Co., Detroit, Mich.

FLANGES—Forged Steel
Harrisburg (Pa.) Steel Corp.
Standard Steel Wks. Co., Burnham, Pa.

FLANGES—Welded Steel
King Fifth Wheel Co., 5031 Beaumont Ave., Philadelphia.

FLANGING WORK—Carbon and Alloy
Worth Steel Co., Claymont, Del.

FLEXIBLE SHAFT EQUIPMENT
Lovejoy Flexible Coupling Co., Chicago.

FLOODLIGHTS—Acetylene
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

FLOOR (CONCRETE) REPAIR MATERIALS
Flexrock Co., 892 N. Delaware Ave. Phila., Pa.

FLOOR PLATES—See Plates—Floor or Cellar Door

FLOORING—Acid Proof
Nukem Products Corp., 68 Niagara St. Buffalo, N. Y.

FLOORING—Monolithic
Johns-Manville Corp., 22 East 40th St. New York City.

FLOORING—Open Steel
Blaw-Knox Co., Pittsburgh.
Hendrick Mfg. Co., Carbondale, Pa.

FLUX—Welding
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

FORGING MACHINES—Roll
Ajax Mfg. Co., The, Euclid, Ohio.

FORGING MACHINES—Upset
Ajax Mfg. Co., The, Euclid, Ohio.

FORGINGS—Alloy Steel
Heppenstall Co., Pittsburgh.
National Forge & Ordnance Co., Irvine, Pa.

FORGINGS—Aluminum
Aluminum Co. of America, Pittsburgh.

FORGINGS—Brass, Bronze or Copper
American Brass Co., The, Waterbury, Conn
Commonwealth Brass Corp., Detroit.
Cramp Brass & Iron Foundries Co., Philadelphia.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

FORGINGS—Coin Pressed
Rockford (Ill.) Drop Forge Co.

FORGINGS—Drop, Iron or Steel
Atlas Drop Forge Co., Lansing, Mich.
Bay City Forge Co., Erie, Pa.
Billings & Spencer Co., Hartford, Conn.
Canton (Ohio) Drop Forging & Mfg. Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Forging & Casting Corp., The, Ferndale, Mich.
Poor & Co., Canton Forge & Axle Wks., Canton, Ohio
Rockford (Ill.) Drop Forge Co.
Storms Drop Forging Co., Springfield, Mass.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

FORGINGS—Hollow
Harrisburg (Pa.) Steel Corp.
Midvale Co., The, Nicetown, Phila., Pa.
National Forge & Ordnance Co., Irvine, Pa.

FORGINGS—Hydraulic Press, Iron or Steel
Atlas Drop Forge Co., Lansing, Mich.
Bethlehem (Pa.) Steel Company.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
National Forge & Ordnance Co., Irvine, Pa.
Standard Steel Wks. Co., Burnham, Pa.

FORGINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

FORGINGS—Upset
Bethlehem (Pa.) Steel Company.
Lamson & Sessions Co., The, Cleveland.
Rockford (Ill.) Drop Forge Co.

FOUNDRY EQUIPMENT & SUPPLIES
Whiting Corp., Harvey, Ill.

FURNACE ENGINEERS
Flinn & Dreffein Co., Chicago.
Kemp, C. M., Mfg. Co., The, Baltimore Md.
Salem (Ohio) Engineering Co.

FURNACES—Annealing & Case Hardening
American Gas Furnace Co., Elizabeth, N. J
Continental Roll & Steel Fdry. Co., East Chicago, Ind.
Kemp, C. M., Mfg. Co., The, Baltimore, Md.
Leeds & Northrup Co., Philadelphia.
Pennsylvania Industrial Engineers, Pittsburgh.
Salem (Ohio) Engineering Co.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Billet or Ingot Heating
Flinn & Dreffein Co., Chicago.
Salem (Ohio) Engineering Co.

FURNACES—Brass Melting
Monarch Engineering & Mfg. Co., The, Baltimore, Md.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Electric, Steel Melting
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
General Electric Co., Schenectady, N. Y.
Pittsburgh (Pa.) Lectromelt Furnace Corp.

FURNACES—Enameling
Carborundum Co., The, Perth Amboy, N. J.

FURNACES—Forging
Holcroft & Co., Detroit.
Salem (Ohio) Engineering Co.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Heat Treating, Automatic
Amer. Gas Furnace Co., Elizabeth, N. J.
Holcroft & Co., Detroit.
Leeds & Northrup Co., Philadelphia.
Rockwell, W. S., Co., 50 Church St., N.Y.C
Salem (Ohio) Engineering Co.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Heat Treating, Cyanide or Lead
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Heat Treating, Electric
General Electric Co., Schenectady, N. Y.
Holcroft & Co., Detroit.
Hoskins Mfg. Co., Detroit, Mich.
Leeds & Northrup Co., Philadelphia.
Rockwell, W. S., Co., 50 Church St., N.Y.C
Salem (Ohio) Engineering Co.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FURNACES—Heat Treating, Oil or Gas
Holcroft & Co., Detroit.
Monarch Engineering & Mfg. Co., The, Baltimore, Md.
Rockwell, W. S., Co., 50 Church St., N.Y.C.
Salem (Ohio) Engineering Co.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Pack Heating Sheets
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Wean Engineering Co., Inc., The, Warren, Ohio.

FURNACES—Rivet Heating, Electric
General Electric Co., Schenectady, N. Y.

FURNACES—Rivet Heating, Gas
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

FURNACES—Wire, Annealing and Galvanizing
General Electric Co., Schenectady, N. Y.
Salem (Ohio) Engineering Co.
Stewart Furnace Div., Chicago Flexible Shaft Co., Chicago.

GAGE BLOCKS
Ford Motor Co. (C. E. Johansson Division), Dearborn, Mich.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GAGES—Dial
Starrett, L. S., Co., Athol, Mass.

GAGES—Plug and Snap
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

GAGES—Thickness, for Rolling Mills
Haines Gauge Co., The, Phila., Pa.

GAGES—Thread Lead
Bausch & Lomb Optical Co., Rochester, N. Y.
Jones & Lamson Mch. Co., Springfield, Vt.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GAGES—Temperature
Weston Electrical Instrument Corp., Newark, N. J.

GALVANIZING
Cattie, Joseph P., & Bros., Phila.

GALVANIZING COMPOUNDS
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

GALVANIZING PLANTS—For Sheets
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Erie (Pa.) Foundry Co.

GAS ANALYSIS RECORDERS
Leeds & Northrup Co., Philadelphia.

GAS—Boosters and Exhausters
Roots-Connersville Blower Corp., Connersville, Ind.

GAS FOR INDUSTRIAL USES
American Gas Association, 420 Lexington Ave., N. Y. C.

GAS PRODUCERS
Flinn & Dreffein Co., Chicago.
Koppers Co., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Wood, R. D., & Co., Philadelphia.

GAS RECOVERY COKE OVENS
Koppers Co., Pittsburgh.

GASKETS—Asbestos, Metal or Rubber
Garlock Packing Co., The, Palmyra, N. Y.
Johns-Manville Corp., 22 East 40th St., New York City.

GASKETS—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

GEAR CHECKING EQUIPMENT
Michigan Tool Co., Detroit, Mich.

GEAR CUTTING
Earle Gear & Machine Co., Phila.
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Gleason Works, Rochester, N. Y.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

GEAR CUTTING MACHINES
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Gleason Works, Rochester, N. Y.

GEAR DRIVES—Herringbone
Lewis Foundry & Machine Div. of Blaw-Knox Co., Pittsburgh.
United Engineering & Fdry. Co., Ptgh.

GEAR HOBBING MACHINES
Barber-Colman Co., Rockford, Ill.

GEAR LAPPING MACHINES
Michigan Tool Co., Detroit, Mich.

GEARMOTORS
Allis-Chalmers Mfg. Co., Milwaukee.
Reliance Electric & Engng. Co., Cleveland.
Westinghouse Elec. & Mfg. Co., East Ptgh.

GEAR PLANNING MACHINES
Gleason Works, Rochester, N. Y.

GEAR SHAVING MACHINES
Michigan Tool Co., Detroit, Mich.

GEARS—Bevel
Gleason Works, Rochester, N. Y.

GEARS—Heat Treated
Gleason Works, Rochester, N. Y.
Simonds Gear & Mfg. Co., Pittsburgh.

GEARS—Herringbone
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.
Mesta Mch. Co., Pittsburgh.

GEARS—Machine Cut
Cleveland (Ohio) Worm & Gear Co.
Gleason Works, Rochester, N. Y.
Simonds Gear & Mfg. Co., Pittsburgh.

GEARS—Machine Molded
Poole Foundry & Mch. Co., Baltimore, Md.

GEARS—Non-Metallic
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
General Electric Co., Schenectady, N. Y.

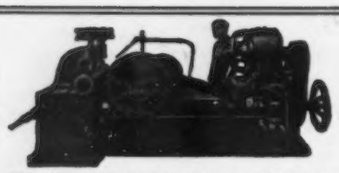
GEARS—Rawhide
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

GEARS—Spur
Simonds Gear & Mfg. Co., Pittsburgh.

GEARS—Worm
Cleveland (Ohio) Worm & Gear Co.
Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.

GENERATORS—Acetylene
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

GENERATORS—Electric
Chicago (Ill.) Electric Co.
Fairbanks, Morse & Co., Chicago.
Lincoln Electric Co., The, Cleveland.
Reliance Electric & Engng. Co., Cleveland.
Westinghouse Elec. & Mfg. Co., East Ptgh.



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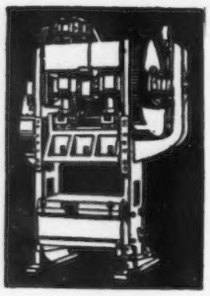

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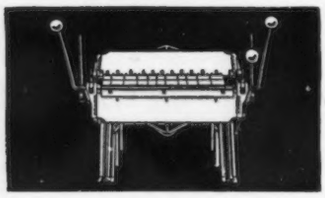

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PRODUCTS INDEX

GENERATORS—Electric, Second Hand. (See Clearing House Section)

GOGGLES—Safety
American Optical Co., Southbridge, Mass.

GOVERNORS—Air Compressor
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

GRABS—For Sheets and Coils
J-B Engineering Sales Co., 1738 Orange St., New Haven, Conn.

GRATING—Flooring, Sidewalk, etc.—See Flooring—Open Steel

GREASE—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Pure Oil Co., The, Chicago.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

GRILLES—Metal Cane
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

GRILLES—Perforated Metal
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

GRINDING AND POLISHING MACHINES
Excelsior Tool & Mch. Co., E. St. Louis, Ill
Norton Co., Worcester, Mass.
Production Machine Co., Greenfield, Mass.

GRINDING MACHINES—Belt
Production Machine Co., Greenfield, Mass.

GRINDING MACHINES—Centerless
Cincinnati (Ohio) Grinders Incorporated.

GRINDING MACHINES—Cutter & Reamer
Cincinnati (Ohio) Milling Mch. Co., The.
Landis Tool Co., Waynesboro, Pa.

GRINDING MACHINES—Cylindrical
Brown & Sharpe Mfg. Co., Providence, R.I.
Cincinnati (Ohio) Grinders Incorporated.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES—Die
Landis Mch. Co., Inc., Waynesboro, Pa.

GRINDING MACHINES—Gear & Worm
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GRINDING MACHINES—Hob
Barber-Colman Co., Rockford, Ill.

GRINDING MACHINES—Internal
Greenfield (Mass.) Tap & Die Corp.

GRINDING MACHINES—Internal Multiple Spindle
Baird Mch. Co., The, Bridgeport, Conn.

GRINDING MACHINES—Portable Flexible Shaft
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GRINDING MACHINES—Portable Pneumatic
Ingersoll-Rand Co., 11 Broadway, New York City.
Warner & Swasey Co., The, Cleveland.

GRINDING MACHINES—Precision Thread
Jones & Lamson Machine Co., Springfield, Vt.

GRINDING MACHINES—Roll
Cincinnati (Ohio) Grinders Incorporated.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Landis Tool Co., Waynesboro, Pa.

GRINDING MACHINES—Snagging
Warner & Swasey Co., The, Cleveland.

GRINDING MACHINES—Surface
Abrasive Machine Tool Co., E. Prov., R. I.
Norton Co., Worcester, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GRINDING MACHINES—Tool
Cincinnati (Ohio) Milling Mch. Co., The.
Landis Tool Co., Waynesboro, Pa.
LeBlond, R. K., Mch. Tool Co., Cincinnati.
Norton Co., Worcester, Mass.

GRINDING MACHINES—Universal
Cincinnati (Ohio) Grinders Incorporated.
Landis Tool Co., Waynesboro, Pa.
Norton Co., Worcester, Mass.

GRINDING MACHINES—Valve
Landis Tool Co., Waynesboro, Pa.

GRINDING WHEELS
Bakelite Corp., 247 Park Ave., N. Y. C.
Carborundum Co., The, Niagara Falls, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
Norton Co., Worcester, Mass.

GRIT—Steel
Harrison Abrasive Corp., Manchester, N. H.
Pittsburgh (Pa.) Crushed Steel Co.

HACK SAW BLADES—See Saws—Hack Saw Blades

HACK SAW MACHINES
Armstrong-Blum Mfg. Co., Chicago.

HAMMERS—Air, Forging
Chambersburg (Pa.) Engineering Co.
Nazel Engineering & Machine Works, Philadelphia.

HAMMERS—Chipping & Riveting—Pneumatic
Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS—Drop
Billings & Spencer Co., Hartford, Conn.
Chambersburg (Pa.) Engineering Co.
Erie (Pa.) Foundry Co.
Morgan Engineering Co., The, Alliance, O.

HAMMERS—Helve
Bradley, C. C., & Son, Inc., Syracuse, N. Y.

HAMMERS—Pneumatic
Chambersburg (Pa.) Engineering Co.
Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS—Power
Bradley, C. C., & Son, Inc., Syracuse, N. Y.
Chambersburg (Pa.) Engineering Co.

HAMMERS—Rawhide
Chicago (Ill.) Rawhide Mfg. Co., 1306 Elston Ave.

HAMMERS—Steam
Chambersburg (Pa.) Engineering Co.
Erie (Pa.) Foundry Co.
Morgan Engineering Co., The, Alliance, O.

HANGERS—Ball Bearing
S K F Industries, Inc., Front St. & Erie Ave., Phila., Pa.

HANGERS—Pressed Steel
American Pulley Co., Pressed Steel Stamping Div., Philadelphia.

HEADING MACHINES
Ajax Mfg. Co., The, Euclid, Ohio.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

HEADS—Spun and Pressed
Worth Steel Co., Claymont, Del.

HEAT TREATING
Barnes-Gibson-Raymond, Detroit Plant Div. of Associated Spring Corp.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
General Machine Wks., York, Pa.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Parish Pressed Steel Co., Reading, Pa.
Pennsylvania Industrial Engineers, Pittsburgh.

HEAT TREATING EQUIPMENT — Air Draw
Herrington & Randall, Inc., Detroit.

HEATERS—Unit
Buffalo (N. Y.) Forge Co., 492 Broadway.

HOBS
Barber-Colman Co., Rockford, Ill.

HOISTS—Air
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Detroit (Mich.) Hoist & Mach. Co.
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
Northern Engineering Works, Detroit.

HOISTS—Chain
Reading (Pa.) Chain & Block Corp.
Wright Mfg. Div., American Chain & Cable Co., Inc., York, Pa.
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

HOISTS—Electric
American Engineering Co., Philadelphia.
Detroit (Mich.) Hoist & Mach. Co.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Maris Brothers, Inc., Philadelphia.
Northern Engineering Works, Detroit, Mich.
Reading (Pa.) Chain & Block Corp.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

PRODUCTS INDEX

Wright Mfg. Div., American Chain & Cable Co., Inc., York, Pa.
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

HOISTS—Electric Traveling
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

HOISTS—Monorail
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

HOSE—Air, Oil, Steam and Water
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

HOSE—Flexible Metallic
American Brass Co., The, Waterbury, Conn.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

HOSE—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

HYDRANTS—Fire
Wood, R. D., & Co., Philadelphia.

HYDRAULIC FEEDS
Vickers, Inc., 1420 Oakman Blvd., Detroit.

HYDRAULIC MACHINERY
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Chambersburg (Pa.) Engineering Co.
Farquhar, A. B., Co., Ltd., York, Pa.
Hydraulik Gmbh, Duisburg, Germany.
Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
Morgan Engineering Co., The, Alliance, O.
Wood, R. D., & Co., Philadelphia.

INGOT MOLDS
Shenango Furnace Co., Pittsburgh.
Shenango-Penn Mold Co., Dover, Ohio.
Snyder, W. P., & Co., Pittsburgh.

INGOTS—Aluminum
Aluminum Co. of America, Pittsburgh.

INGOTS—Phosphor Bronze
Phosphor Bronze Smelting Co., The, Phila.

INHIBITORS
American Chemical Paint Co., Ambler, Pa.
Parkin, William M., Co., Pittsburgh.

INSTRUMENTS—Electric
Weston Electrical Instrument Corp., Newark, N. J.

INSTRUMENTS—Recording
Leeds & Northrup Co., Philadelphia.

INSULATION
Johns-Manville Corp., 22 East 40th St., New York City.

INSULATION—Fibre, Electrical
Corning Glass Works, Fibre Products Div., Corning, N. Y.

IRON—Rustless
Ludlum Steel Co., Watervliet, N. Y.

IRON WORKERS—Universal
Buffalo (N. Y.) Forge Co., 492 Broadway.

JIGS, FIXTURES, DIES, etc. (See Dies, Jigs, Fixtures, etc.)

KEYS—Riveted
Western Wire Prods. Co., St. Louis, Mo.

KEYSEATING MACHINES
Baker Bros., Inc., Toledo, Ohio.
Davis Keyseater Co., 400 Exchange St., Rochester, N. Y.

LACING—Belt, Rawhide or Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

LAMPS—Filament
General Electric Co., Cleveland.

LAMPS—Mercury Vapor
General Electric Vapor Lamp Co., Hoboken, N. J.

LAPPING MACHINES
Cincinnati (Ohio) Grinders Incorporated.

LATHES—Automatic
Baird Mch. Co., The, Brideport, Conn.
Goss & De Leeuw Mch. Co., New Britain, Conn.
Jones & Lamson Mch. Co., Springfield, Vt.
LeBlond, R. K., Mch. Tool Co., Cincinnatti.
Monarch Mch. Tool Co., The, Sidney, O.
Potter & Johnston Machine Co., Pawtucket, R. I.

LATHES—Automatic Vertical
Baird Mch. Co., The, Bridgeport, Conn.

LATHES—Bench
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

LATHES—Brass
Warner & Swasey Co., The, Cleveland.

LATHES—Chucking
Jones & Lamson Mch. Co., Springfield, Vt.
Potter & Johnston Machine Co., Pawtucket, R. I.
Warner & Swasey Co., The, Cleveland.

LATHES—Contour Turning
Monarch Mch. Tool Co., The, Sidney, O.

LATHES—Crankshaft
LeBlond, R. K., Mch. Tool Co., Cincinnati.
Potter & Johnston Machine Co., Pawtucket, R. I.

LATHES—Engine
Cincinnati (Ohio) Lathe & Tool Co.
Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.
LeBlond, R. K., Mch. Tool Co., Cincinnati.
Monarch Mch. Tool Co., The, Sidney, O.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

LATHES—Roll
Lewis Foundry & Machine Div. of Blaw-Knox Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
United Engineering & Fdry. Co., Ptgh.

LATHES — Second-Hand. (See Clearing House Section)

LATHES—Toolroom
Cincinnati (Ohio) Lathe & Tool Co.
LeBlond, R. K., Machine Tool Co., Cincinnati, Ohio.
Monarch Mch. Tool Co., The, Sidney, O.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

LATHES—Turret
Bardons & Oliver, Cleveland.
Foster Machine Co., Elkhart, Ind.
Jones & Lamson Mch. Co., Springfield, Vt.
Potter & Johnston Machine Co., Pawtucket, R. I.
Warner & Swasey Co., The, Cleveland.

LATHES, Turret, Vertical
Rogers Machine Wks., Alfred, New York.

LAYOUT FLUID
Dayton Rogers Mfg. Co., Minneapolis, Minn.

LEAD LININGS
National Lead Co., 111 Bdway., N. Y. C.

LEAD—In Oil
National Lead Co., 111 Bdway., N. Y. C.

LEAD—Tellurium
National Lead Co., 111 Bdway., N. Y. C.

LEATHER—Cup
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

LEVELING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Wean Engineering Co., Inc., The, Warren, O.

LOCK WASHER MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

LOCOMOTIVES—Electric
Atlas Car & Mfg. Co., The, Cleveland.
Baldwin Locomotive Wks., The, Paschall Sta., Phila.
Davenport (Iowa) Locomotives Works.
General Electric Co., Schenectady, N. Y.
Whitcomb Locomotive Co., Paschall Sta., Phila.

LOCOMOTIVES—Gas-Electric
Davenport (Iowa) Locomotives Works.

LOCOMOTIVES—Gasoline
Baldwin Locomotive Wks., The, Paschall Sta., Phila.
Plymouth (Ohio) Locomotive Wks.
Whitcomb Locomotive Co., Paschall Sta., Phila.

LOCOMOTIVES—Industrial
Baldwin Locomotive Wks., The, Paschall Sta., Phila.
Davenport (Iowa) Locomotives Works.
Plymouth (Ohio) Locomotive Wks.
Whitcomb Locomotive Co., Paschall Sta., Phila.

LOCOMOTIVES—Steam
Iron & Steel Products, Inc., Chicago.

LOCOMOTIVES—Storage Battery
Atlas Car & Mfg. Co., The, Cleveland.

LUBRICANTS—Crusher & Grinding
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco. Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Gear
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco. Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

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DETROIT—E. R. Wegener, 514 Stephenson Bldg.
CLEVELAND—Paterson-Leitch Co., 900 East 69th St.
BUFFALO—J. J. Lambert, 323 Huntington Ave.
DAYTON—Central Steel & Wire Co., 1095 East Monument Ave.
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PRODUCTS INDEX

Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—High Pressure & Temperature
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Pure Oil Co., The, Chicago.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Mine Cars
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Mining Machines
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Railroad
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Roll Neck—Anti-Friction & Plain
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 E. 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Tipple & Cleaning
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco; Shell Bldg., St. Louis, and 50 W. 50th St., N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICATING SYSTEMS
Farval Corp., The, Cleveland.

MACHINE GUARD MATERIALS
Erdle Perforating Co., Rochester, N. Y.

MACHINE WORK
General Machine Works, York, Pa.
Nelson Bros. & Strom, Racine, Wis.
Peco Manufacturing Corp., Philadelphia.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

MACHINERY DEALERS—Second-Hand, (See Clearing House Section)

MACHINISTS' SMALL TOOLS
Brown & Sharpe Mfg. Co., Providence, R. I.
Millers Falls Co., Greenfield, Mass.
Starrett, L. S., Co., Athol, Mass.

MAGNESITE—Brick or Dead Burnt
Carborundum Co., The, Perth Amboy, N. J.

MAGNESIUM
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

MAGNETS—Lifting
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleve.
Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.

MAGNETS — Separating—See Separators—Magnetic

MALLETS—Rawhide
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

MANDRELS—Expanding
Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

MANGANESE METAL AND ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

MANHOLE FITTINGS AND SADDLES
Worth Steel Co., Claymont, Del.

MANIFOLDS—Oxygen & Acetylene
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

MARKING MACHINES
Noble & Westbrook Mfg. Co., The, East Hartford, Conn.

METAL SPECIALTIES
Crosby Co., The, Buffalo, N. Y.
Toledo (Ohio) Stamping & Mfg. Co.
Torrington (Conn.) Company.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.
Worcester (Mass.) Stamped Metal Co., 6 Hunt St.
York (Pa.) Corrugating Co.

METALLOGRAPHIC EQUIPMENT
Bausch & Lomb Optical Co., Rochester, N. Y.

METALS—Coating
Metals Coating Co. of America, Phila., Pa.

METERS—Electric Welding
Lincoln Electric Co., The, Cleveland.

METERS—Flow
Leeds & Northrup Co., Philadelphia.

METERS—Gas or Air
Roots-Connersville Blower Corp., Connersville, Ind.

METERS—Water & Oil
Worthington Pump & Machinery Corp., Harrison, N. J.

MICRO-PHOTOGRAPHIC EQUIPMENT
Bausch & Lomb Optical Co., Rochester, N. Y.

MICROMETERS
Starrett, L. S., Co., Athol, Mass.

MICROMETERS—Dial for Sheet Metal
Haines Gauge Co., The, Phila., Pa.

MICROSCOPES—Toolmakers
Bausch & Lomb Optical Co., Rochester, N. Y.

MILLING MACHINES—Automatic
Cincinnati (Ohio) Milling Mch. Co., The.
Potter & Johnston Machine Co., Pawtucket, R. I.

MILLING MACHINES—Horizontal
Brown & Sharpe Mfg. Co., Prov., R. I.
Cincinnati (Ohio) Milling Mch. Co., The.
Potter & Johnston Machine Co., Pawtucket, R. I.

MILLING MACHINES—Planer Type
Cincinnati (Ohio) Planer Co.

MILLING MACHINES — Second - Hand. (See Clearing House Section)

MILLING MACHINES—Vertical
Brown & Sharpe Mfg. Co., Prov., R. I.
Cincinnati (Ohio) Milling Mch. Co., The.
Potter & Johnston Machine Co., Pawtucket, R. I.

MOLDING MACHINES
Tabor Mfg. Co., Phila., Pa.

MONEL METAL
International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

MONORAIL SYSTEMS—Hand & Electric
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

MOTORS—Electric
Allis-Chalmers Mfg. Co., Milwaukee.
Chicago (Ill.) Electric Co.
Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., Cleveland.
Reliance Electric & Engineering Co., Cleveland.
Westinghouse Elec. & Mfg. Co., E. Ptgh.

MOTORS—Electric, Second-Hand. (See Clearing House Section)

NAILS—Wire
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Hassall, John, Inc., Clay & Oakland Sts., Bklyn., N. Y.
Pittsburgh (Pa.) Steel Co.
Wickwire Brothers, Cortland, N. Y.
Youngstown (Ohio) Sheet & Tube Co., The.

NIBBLING MACHINES
Gray Machine Co., Philadelphia.

NICKEL
International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

NITROGEN
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

NOZZLES—Sand Blasting
Norton Co., Worcester, Mass.

NOZZLES—Spray
Marley Co., The, Kansas City, Kansas.

NUMBERING MACHINES—For Metal
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

NUT MACHINERY — Automatic Cold Pressed
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

NUTS—Acorn
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Castellated
National Acme Co., The, Cleveland.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

PRODUCTS INDEX

NUTS—Cold Punched
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Hot Pressed
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Lock
Standard Pressed Steel Co., Jenkintown, Pa.

NUTS—Machine Screw
Progressive Mfg. Co., Torrington, Conn.

NUTS—Semi-Finished
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Special
Tinnerman Stove & Range Co., Speed Nut Div., Cleveland.

NUTS—Thumb Malleable
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

OIL & GREASE SEALS
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
Garlock Packing Co., The, Palmyra, N. Y.

OIL RETAINERS
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

OIL STONES
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

OILS—Cutting
Penola, Inc., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago, Ill.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Fuel
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Standard Oil Co. (Indiana), Chicago, Ill.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Penola, Inc., Pittsburgh.
Pure Oil Co., The, Chicago.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Texas Company, The, 135 East 42nd St. N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Soluble—See Oils—Cutting

ORES—Iron
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Shenango Furnace Co., Pittsburgh.
Snyder, W. P., & Co., Pittsburgh.

OVENS—Coke and By-Product Recovery
Koppers Co., Pittsburgh.

OVENS—Core and Mold
Herrington & Randall, Inc., Detroit.
Holcroft & Co., Detroit.
Monarch Engineering & Mfg. Co., The, Baltimore, Md.

OVENS—Cross Regenerative
Koppers Co., Pittsburgh.

OVENS—Enameling and Japanning
Carborundum Co., The, Perth Amboy, N. J.
Herrington & Randall, Inc., Detroit.

OXY-ACETYLENE — Shape-Cutting Machines
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

OXYGEN
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

PACKING—Felt
American Felt Co., 315 Fourth Ave., N. Y. C.

PACKING—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Metallic
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

PACKING—Sheet, Asbestos or Rubber
Garlock Packing Co., The, Palmyra, N. Y.
Johns-Manville Corp., 22 East 40th St., New York City.

PAINT
National Lead Co., 111 Bdway., N. Y. C

PARALLELS
Ford Motor Co. (C. E. Johansson Div.), Dearborn, Mich.

PERFORATED METAL
Chicago Perforating Co., 2440 W 24th Place, Chicago, Ill.
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

PHOSPHOR—Copper
Phosphor Bronze Smelting Co., The, Phila.

PICKLING COMPOUNDS
American Chemical Paint Co., Ambler, Pa

PICKLING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Mesta Mch. Co., Pittsburgh.

PICKLING TANK LININGS
Keagler Brick Co., Steubenville, Ohio.
National Lead Co., 111 Bdway., N. Y. C.

PICKLING TANK STEAM JETS
Durion Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

PIG IRON
Bethlehem (Pa.) Steel Co.
Brooke, E. & G., Iron Co., Birdsboro, Pa.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Jackson (Ohio) Iron & Steel Co., The.
Republic Steel Corp., Cleveland, Ohio.
Shenango Furnace Co., Pittsburgh.
Shenango-Penn Mold Co., Dover, Ohio.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

PILING—Steel Pipe
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PILING—Steel Sheet
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

PINIONS—Rolling Mill
Mesta Mch. Co., Pittsburgh.

PINIONS—Wire and Rod
Rathbone, A. R. & J., Palmer, Mass.

PINS—Cotter
Lamson & Sessions Co., The, Cleveland.

PIPE—Cast Iron, B. & S. and Flanged
Wood, R. D., & Co., Philadelphia.

PIPE—Hammer Welded
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PIPE—Lead
National Lead Co., 111 Bdway., N. Y. C.

PIPE—Lead Lined
National Lead Co., 111 Bdway., N. Y. C.

PIPE—New and Second-Hand
Albert & Davidson Pipe Corp., 2nd Ave., 50-51st St., Bklyn., N. Y.
Albert Pipe Supply Co., Inc. Berry and N. 13th St., Bklyn., N. Y.
Greenpoint Iron & Pipe Co., Inc., Stagg & Bogart Sts., Bklyn., N. Y.

PIPE—Seamless Brass or Copper
American Brass Co., The, Waterbury, Conn.

PIPE—Spiral Welded
American Rolling Mill Co., Middletown, O.
Crane Co., Chicago.

PIPE—Standard, Black and Galvanized
Bethlehem (Pa.) Steel Co.
Jones & Laughlin Steel Corp., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

PIPE—Welded, Electric
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.

PIPE COVERING—Asbestos
Johns-Manville Corp., 22 East 40th St., New York City.

PIPE CUTTERS
Ridge Tool Co., Elyria, Ohio.

PIPE FITTINGS
Crane Co., Chicago.
Jarecki Mfg. Co., Erie, Pa.

PIPE THREADERS
Ridge Tool Co., Elyria, Ohio.

PIPE THREADING & CUTTING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Cox & Sons Co., The, Bridgeton, N. J.
Jarecki Mfg. Co., Erie, Pa.
Landis, Mach. Co., Inc., Waynesboro, Pa.
Merrell Mfg. Co., Toledo.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PLANERS
Cincinnati (Ohio) Planer Co.

PLANERS—Rotary
Espen-Lucas Mch. Wks., Philadelphia.

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Bakelite Corp., 247 Park Ave., N. Y. C.

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Inland Steel Co., Chicago.
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Weirton (W. Va.) Steel Co.
Worth Steel Co., Claymont, Del.
Youngstown (Ohio) Sheet & Tube Co., The.

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Standard Pressed Steel Co., Jenkintown, Pa.

PLUGS—Core Hole
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.

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Packer Machine Co., The, Meriden, Conn.

POLISHING MACHINES
Packer Machine Co., The, Meriden, Conn.

POLISHING MACHINES—Bar
Medart Co., The, St. Louis, Mo.

POLISHING MACHINES—Belt
Production Machine Co., Greenfield, Mass.

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Cushman Chuck Co., Hartford, Conn.
New Departure Div., General Motors Corp., Bristol, Conn.

POWER UNITS—Straight Line
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Parish Pressed Steel Co., Reading, Pa.
Toledo (Ohio) Stamping & Mfg. Co.
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York (Pa.) Corrugating Co.

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Niagara Mch. & Tool Wks., Buffalo, N. Y.
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Galland-Henning Mfg. Co., Milwaukee.

PRESSES—Baling, Hydraulic
Baldwin-Southwark Corp., Southwark Div. Philadelphia.
Galland-Henning Mfg. Co., Milwaukee.

PRESSES—Coining
Ferracute Machine Co., Bridgeton, N. J.
Zeh & Hahnemann Co., Newark, N. J.

PRESSES—Drop—See Hammers—Drop

PRESSES—Foot
Baird Mch. Co., The, Bridgeport, Conn.
Ferracute Machine Co., Bridgeton, N. J.
Niagara Machine & Tool Works, Buffalo, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

PRESSES—Forging
Ajax Mfg. Co., The, Euclid, Ohio.
Chambersburg (Pa.) Engineering Co.
Ferracute Machine Co., Bridgeton, N. J.
Hydraulik Gmbh, Duisburg, Germany.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.

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Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Ferracute Machine Co., Bridgeton, N. J.
Niagara Mch. & Tool Wks., Buffalo, N. Y.
Streine Tool & Mfg. Co., New Bremen, Ohio.

PRESSES—Friction Screw
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Zeh & Hahnemann Co., Newark, N. J.

PRESSES—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Chambersburg (Pa.) Engineering Co.
Farquhar, A. B., Co., Ltd., York, Pa.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Hannifin Mfg. Co., Chicago.
Hydraulik Gmbh, Duisburg, Germany.
Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.
Oilgear Co., The, 1311 W. Bruce, Milwaukee.
Wood, R. D., & Co., Philadelphia.

PRESSES—Power
Baird Mch. Co., The, Bridgeport, Conn.
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Farrel-Birmingham Co., Inc., Ansonia Conn.
Ferracute Machine Co., Bridgeton, New Jersey.
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New Albany (Ind.) Mch. Mfg. Co.
Niagara Machine & Tool Wks., Buffalo, N.Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
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Zeh & Hahnemann Co., Newark, N. J.

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Erie (Pa.) Foundry Co.
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Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.

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Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

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PULVERIZERS—Coal Firing
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Tomkins-Johnson Co., The, Jackson, Mich.
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Worthington Pump & Machinery Corp., Harrison, N. J.

PUMPS—Vacuum
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Niagara Machine & Tools Works, Buffalo, N. Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Thomas Mach. Mfg. Co., Pittsburgh.

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Leeds & Northrup Co., Philadelphia.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
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Frank, M. K., 480 Lexington Ave., N. Y. C.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

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Iron & Steel Products, Inc., Chicago.
Sherwood, E. C., 50 Church St., N. Y. C.

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Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

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Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

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Clark Bros. Bolt Co., Milldale, Conn.
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RODS—Brass
American Brass Co., The, Waterbury, Conn.

RODS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave. Midland, Mich.

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American Brass Co., The, Waterbury, Conn.

RODS—Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.

RODS—Rustless
Rustless Iron & Steel Corp., Baltimore, Md.

RODS—Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.
Pittsburgh (Pa.) Steel Co.

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Pittsburgh (Pa.) Steel Co.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.
Youngstown (Ohio) Sheet & Tube Co., The.

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Kemp, C. M., Mfg. Co., The, Baltimore, Md.

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United Engineering & Fdry. Co., Ptgh.

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ROLLING MACHINERY—Sheet Leveler
Streine Tool & Mfg. Co., New Bremen, Ohio.

ROLLING MACHINERY—Sheet Metal
Lewis Foundry & Machine Div. of Blaw-Knox Co., Pittsburgh.
Streine Tool & Mfg. Co., New Bremen, Ohio.

ROLLING MACHINERY—Sheet Piling
Streine Tool & Mfg. Co., New Bremen, Ohio.

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Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Continental Roll & Steel Fdry. Co., East Chicago, Ind.
Farrel-Birmingham Co., Inc., Ansonia, Ct.
Hyde Park (Pa.) Fdry. & Mch. Co.
Lewis Foundry & Machine Div. of Blaw-Knox Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Morgan Engineering Co., The, Alliance, O.
National Roll & Fdry. Co., Avonmore, Pa.
United Engineering & Fdry. Co., Ptgh.
Waterbury (Ct.) Farrel Fdry. & Mch. Co. The.

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Continental Roll & Steel Fdry. Co., East Chicago, Ind.

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Bertsch & Co., Cambridge City, Ind.
Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

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Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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Aetna-Standard Engineering Co., The Youngstown, Ohio.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Continental Roll & Steel Fdry. Co., East Chicago, Ind.
Hyde Park (Pa.) Fdry. & Mch. Co.
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Jones & Laughlin Steel Corp., Pittsburgh.
Weirton (W. Va.) Steel Co.

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New Jersey Zinc Co., The, 160 Front St., N. Y. C.

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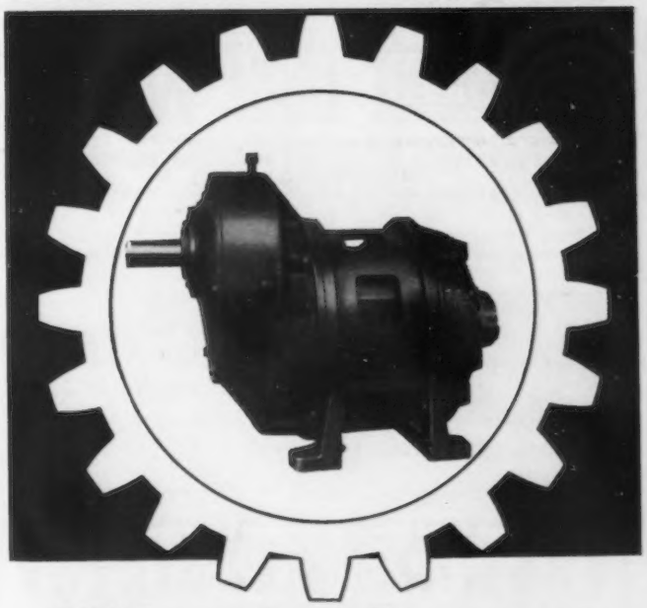

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Tannewitz Works, The, Grand Rapids Mich.
Wells Mfg. Corp., Three Rivers, Mich.

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Atkins, E. C., & Co., Indianapolis.

SAWS—Friction
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Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Hack Saw Blades
Atkins, E. C., & Co., Indianapolis.
Millers Falls Co., Greenfield, Mass.
Starrett, L. S., Co., Athol, Mass.

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Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Inserted Tooth, Cold
Disston, Henry, & Sons, Inc., Philadelphia.
Tabor Mfg. Co., Philadelphia.

SAWS—Milling
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Screw Slotting
Barber-Colman Co., Rockford, Ill.

SCALES
Fairbanks, Morse & Co., Chicago.

SCRAP BUNDLING MACHINES—Metal
Cox & Sons Co., The, Bridgeton, N. J.

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Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

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Ludlow-Saylor Wire Co., St. Louis, Mo.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

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SCREW DRIVERS—Recessed Head Type
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National Acme Co., The, Cleveland.
Olson Mfg. Co., Worcester, Mass.
Ottemiller, Wm. H., Co., Inc., York, Pa.
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Victor Screw & Machine Co., The, Toledo, Ohio.

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Cone Automatic Machine Co., Inc., Windsor, Vt.
Foster Machine Co., Elkhart, Ind.
National Acme Co., The, Cleveland.

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Foster Machine Co., Elkhart, Ind.
Warner & Swasey Co., The, Cleveland.

SCREW MACHINERY—Multiple Spindle
Cone Automatic Machine Co., Inc., Windsor, Vt.
National Acme Co., The, Cleveland.

SCREW PLATES
Greenfield (Mass.) Tap & Die Corp.

SCREW STOCK
Jones & Laughlin Steel Corp., Pittsburgh.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

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National Acme Co., The, Cleveland
Ottemiller, Wm. H., Co., Inc., York, Pa.

SCREWS—Coach or Lag
Lamson & Sessions Co., The, Cleveland.

SCREWS—Machine
Lamson & Sessions Co., The, Cleveland.
Progressive Mfg. Co., The, Torrington, Ct.

SCREWS—Machine, Recessed Head
American Screw Co., Providence, R. I.

SCREWS—Safety Set
Standard Pressed Steel Co., Jenkintown, Pa.

SCREWS—Set
National Acme Co., The, Cleveland.
Ottemiller, Wm. H., Co., Inc., York, Pa.

SCREWS—Sheet Metal, Recessed Head
American Screw Co., Providence, R. I.

SCREWS, Socket, Head, Cap
Standard Pressed Steel Co., Jenkintown, Pa

SCREWS—Wood, Recessed Head
American Screw Co., Providence, R. I.

SCRIBERS
Ford Motor Co. (C. E. Johansson Div.), Dearborn, Mich.

SCRUBBING MACHINES—Sheet
Wean Engineering Co., Inc., The, Warren, Ohio.

SCYTHE STONES AND WHETSTONES
Carborundum Co., The, Niagara Falls, N.Y.

SECOND - HAND MACHINERY—(See Clearing House Section)

SEPARATORS—Magnetic
Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

SHAFTING—Cold Drawn
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

SHAFTING—Forged
Bay City Forge Co., Erie, Pa.

SHAFTING—Steel
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

SHAFTING—Turned and Ground
Jones & Laughlin Steel Corp., Pittsburgh.
Moltrup Steel Products Co., Beaver Falls, Pa.
Ryerson, Jos. T., & Son, Inc., Chicago.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

SHAPERS
Cincinnati (Ohio) Shaper Co., The.

SHAPERS—Vertical
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

SHAPES—Cold Drawn
Jones & Laughlin Steel Corp., Pittsburgh.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

SHAPES—Wire
American Spring & Mfg. Corp., Holly, Mich.
Cuyahoga Spring Co., The, Cleveland.
Eastern Tool & Mfg. Co., Bloomfield, N. J.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Roebling's, John A. Sons Co., Trenton, N. J.

SHEAR BLADES & KNIVES
American Shear Knife Co., Homestead, Pa.
Canton Fdry. & Mch. Co., Cleveland.
Heppenstall Co., Pittsburgh.

SHEARING MACHINES—Alligator
Canton Fdry. & Mch. Co., Cleveland.

SHEARING MACHINES—Angle, Hand and Power
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y

SHEARING MACHINES—Bar
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Ptgh.

SHEARING MACHINES — Beam and Channel
Schatz Mfg. Co., The, Poughkeepsie, N. Y
United Engineering & Fdry. Co., Ptgh.

SHEARING MACHINES—Billet
Morgan Engineering Co., The, Alliance, O.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Ptgh.

SHEARING MACHINES — Continuous Sheet & Pack
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Streine Tool & Mfg. Co., New Bremen, Ohio.

SHEARING MACHINES—Plate
Bertsch & Co., Cambridge City, Ind.
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y
United Engineering & Fdry. Co., Ptgh.

SHEARING MACHINES—Rotary Slitting Gang
Streine Tool & Mfg. Co., New Bremen, Ohio.

SHEARING MACHINES — Sheet and Plate
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Streine Tool & Mfg. Co., New Bremen, Ohio.

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Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Co., Chicago.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Streine Tool & Mfg. Co., New Bremen, Ohio.

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Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Ferracute Machine Co., Bridgeton, New Jersey.
New Albany (Ind.) Mch. Mfg. Co.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Streine Tool & Mfg. Co., New Bremen, Ohio.
V & O Press Co., Hudson, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

SHEET METAL WORK
York (Pa.) Corrugating Co.

SHEETS—Aluminum
Aluminum Co. of America, Pittsburgh.

SHEETS—Auto Body
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

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SHEETS—Black
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Granite City (Ill.) Steel Co.
Ingersoll Steel & Disc Co., Chicago.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos., T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.

SHEETS—Blue Annealed
Alan Wood Steel Co., Conshohocken, Pa.
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Great Lakes Steel Corp., Detroit.
Ryerson, Jos. T., & Son, Inc., Chicago.
Weirton (W. Va.) Steel Co.
Worth Steel Co., Claymont, Del.

SHEETS—Brass, Bronze, Copper, Nickel, Silver or Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.

SHEETS—Chrome
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Chrome Nickel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Cold Rolled
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos., T., & Son, Inc., Chicago.
Weirton (W. Va.) Steel Co.

SHEETS—Copper Alloy
American Brass Co., The Waterbury, Conn.

SHEETS—Copper Steel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.

SHEETS—Electrical
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Enameling
American Rolling Mill Co., Middletown, O.
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Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Granite City (Ill.) Steel Co.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.

SHEETS—For Drawing and Stamping
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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Superior Sheet Steel Co., Canton, Ohio.
Worth Steel Co., Claymont, Del.

SHEETS—Full Finished
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Galvanized, Flat and Corrugated
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Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

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National Lead Co., 111 Bdway., N. Y. C.

SHEETS—Long Terne
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Weirton (W. Va.) Steel Co.

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Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Pickled
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Tin Mill Black
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.

SHEETS—Zinc
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

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Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

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Nazel Engineering & Machine Works, Philadelphia.

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Gardiner Metal Co., 4884 S. Campbell Ave., Chicago.

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Thomas Mach. Mfg. Co., Pittsburgh.

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Morgan Engineering Co., The, Alliance, O.
Nelson Bros. & Strom, Racine, Wis.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.
Wood, R. D., & Co., Philadelphia.

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SPIKES—Track
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Weirton (W. Va.) Steel Co.

SPLICE BARS
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

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Sleeper & Hartley, Inc., Worcester, Mass.

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Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.
Cuyahoga Spring Co., The, Cleveland.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.
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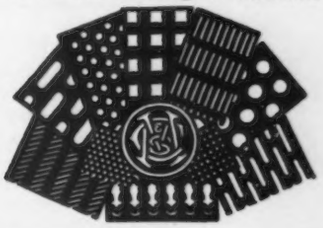

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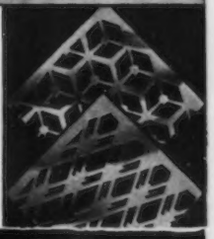

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Whitney Chain & Mfg. Co., Hartford, Ct.

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Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Cortland, N. Y.
Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.
Crosby Co., The, Buffalo, N. Y.
Dayton Rogers Mfg. Co., Minneapolis, Minn.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.
Eastern Tool & Stpg. Co., Inc., Saugus, Mass.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lansing (Mich.) Stamping Co., So. Penn. Ave.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.
Parish Pressed Steel Co., Reading, Pa.
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.
Sessions, J. H., & Son, Hooker Court, Bristol, Conn.
Toledo (Ohio) Stamping & Mfg. Co.
Torrington (Conn.) Company
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Wagner Specialty Co., Burlington, Wis.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.
Worcester (Mass.) Stamped Metal Co., 6 Hunt St.
York (Pa.) Corrugating Co.

STAMPS—Steel Alphabets and Figures
Noble & Westbrook Mfg. Co., The, East Hartfrod, Ct.

STAPLES—Wire
Wickwire Brothers, Cortland, N. Y.

STEEL—Acid Resisting
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

STEEL—Alloy
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Harrisburg (Pa.) Steel Corp.
Ingersoll Steel & Disc Co., Chicago.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
Youngstown (Ohio) Sheet & Tube Co. The.

STEEL—Alloy, Cold Drawn
Moltrup Steel Products Co., Beaver Falls, Pa.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

STEEL—Bright Finished
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

STEEL—Carbon
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Ingersoll Steel & Disc Co., Chicago.

STEEL—Chrome
Barium Stainless Steel Corp., Canton, Ohio.

STEEL—Chrome Nickel
Barium Stainless Steel Corp., Canton Ohio.

STEEL—Chrome Nickel Silver
Ingersoll Steel & Disc Co., Chicago.

STEEL—Cobalt
Darwin & Milner, Inc., Cleveland.

STEEL—Cold Drawn
Jones & Laughlin Steel Corp., Pittsburgh.
Moltrup Steel Products Co., Beaver Falls, Pa.
Rathbone, A. B. & J., Palmer, Mass.
Ryerson, Joseph T., & Son, Inc., Chicago.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

STEEL—Cold Rolled Strips
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Bethlehem (Pa.) Steel Co.
Griffin Mfg. Co., Erie, Pa.
Jones & Laughlin Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Sons, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.
Steel & Tubes, Inc., Cleveland.
Superior Steel Corp., Carnegie, Pa.
Thomas Steel Co., The, Warren, Ohio.
Weirton (W. Va.) Steel Co.
Wetherell Bros. Co., Cambridge, 39, Mass.

STEEL—Cold Rolled Strips, Electro Copper Coated
Thomas Steel Co., The, Warren, Ohio.

STEEL—Cold Rolled Strips, Electro-Galvanized
Thomas Steel Co., The, Warren, Ohio.

STEEL—Cold Rolled Strips, Electro Tin Coated
Thomas Steel Co., The, Warren, Ohio.

STEEL—Cold Rolled Strips, Stainless
Barium Stainless Steel Corp., Canton, Ohio.
Griffin Mfg. Co., Erie, Pa.

STEEL—Corrosion Resisting
Midvale Co., The, Nicetown, Phila., Pa.
Rustless Iron & Steel Corp., Baltimore, Md.
Superior Steel Corp., Carnegie, Pa.

STEEL—Crucible
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.
Vanadium-Alloys Steel Co., Latrobe, Pa.

STEEL—Cutlery
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Die
Disston, Henry, & Sons, Inc., Philadelphia.
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.
Ludlum Steel Co., Watervliet, N. Y.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

STEEL—Drill
Ludlum Steel Co., Watervliet, N. Y.

STEEL—Electric
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Ludlum Steel Co., Watervliet, N. Y.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

STEEL—High Speed
Cleveland (Ohio) Twist Drill Co., The.
Ingersoll Steel & Disc Co., Chicago.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Vanadium-Alloys Steel Co., Latrobe, Pa.

STEEL—Hot Rolled Strips
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
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Inland Steel Co., Chicago.
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Laclede Steel Co., St. Louis, Mo.
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STEEL—Hot Rolled Strips, Electro Zinc Coated
Thomas Steel Co., The, Warren, Ohio.

STEEL—Open Hearth
Pittsburgh (Pa.) Steel Co.
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Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

STEEL—Rustless
Griffin Mfg. Co., Erie, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Rustless Iron & Steel Corp., Baltimore, Md.

STEEL—Screw
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.

STEEL—Special Analysis
Harrisburg (Pa.) Steel Corp.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Cleveland, Ohio.
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Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

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Ryerson, Jos. T., & Sons, Inc., Chicago.
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Superior Steel Corp., Carnegie, Pa.
Union Drawn Steel Div. Republic Steel Corp., Massillon, Ohio.
Wetherell Bros. Co., Cambridge, 39, Mass.

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Ingersoll Steel & Disc Co., Chicago.

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Firth-Sterling Steel Co., McKeesport, Pa.
Ingersoll Steel & Disc Co., Chicago.
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.
Ludlum Steel Co., Watervliet, N. Y.
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Ryerson, Jos., T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
Windau Steel Co., Cleveland.

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Forging & Casting Corp., The, Ferndale, Mich.

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STRAIGHTENING MACHINES—Bar & Tube
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Medart Co., The, St. Louis, Mo.

STRUCTURAL IRON AND STEEL WORK
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Bethlehem (Pa.) Steel Co.
Morgan Engineering Co., The, Alliance, O.

STRUCTURAL STEEL — See Angles, Beams, Channels and Tees

STUDS
Erie (Pa.) Bolt & Nut Co.

SUPERFINISHING MACHINES
Foster Machine Co., Elkhart, Ind.

SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

SWAGING MACHINES
Torrington (Conn.) Company.

SWITCHES—Electric
Westinghouse Elec. & Mfg. Co., East Ptgh.

TANK LININGS
Nukem Prods. Corp., 68 Niagara St., Buffalo, N. Y.

TANK LININGS—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

TANKS—Compressed Air, Gas, Oil and Water
Scaife, Wm. B., & Sons Co., Ptgh.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

TANKS—Iron and Steel
Munroe R., & Sons Mfg. Corp., Pittsburgh.
Scaife, Wm. B., & Sons, Co., Ptgh.

TANKS—Pickling
Blaw-Knox Co., Pittsburgh.
Cleveland (Ohio) Quarries Co., The.
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.

TANKS—Rubber Lined
Blaw-Knox Co., Pittsburgh.
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

TANKS—Welded
Blaw-Knox Co., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Scaife, Wm. B., & Sons Co., Pittsburgh.

TAPPING MACHINES
Baker Bros. Inc., Toledo, Ohio.
National Automatic Tool Co., Richmond, Ind.
Waterbury (Conn.) Farrel Fdry. & Mch. Co.

TAPS—Collapsing
Geometric Tool Co., The, New Haven, Conn.
Landis Mach. Co., Inc., Waynesboro, Pa.
National Acme Co., The, Cleveland.

TAPS AND DIES
Greenfield (Mass.) Tap & Die Corp.
Landis Mch. Co., Inc., Waynesboro, Pa.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Victor Machinery Exchange, 251 Centre St., N. Y. C.

TEES—See Angles, Beams, Channels and Tees

TERNE PLATES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Weirton (W. Va.) Steel Co.

TESTING MACHINES—Hardness
Shore Instrument & Mfg. Co., The, Jamaica, L. I., N. Y.

TESTING MACHINES—Materials
Baldwin-Southwark Corp., Southwark Div. Phila.

THERMOMETERS
Weston Electrical Instrument Corp., Newark, N. J.

THERMOMETERS—Recording
Leeds & Northrup Co., Philadelphia.

THREAD CUTTING TOOLS—See Dies, Taps

THREAD ROLLING MACHINES
Nilson, A. H., Mach. Co., Bridgeport, Ct.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

THREADING MACHINES
Eastern Mcsh. Screw Corp., New Haven, Conn.
Geometric Tool Co., The, New Haven, Conn.
Landis Mch. Co., Inc., Waynesboro, Pa.

THREADING MACHINES—Automatic
Landis Mch. Co., Inc., Waynesboro, Pa.

TIE PLATES
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Weirton (W. Va.) Steel Co.

TIN PLATE
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

TIN PLATE MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Wean Engineering Co., Inc., The, Warren, Ohio.

TINNING EQUIPMENT—Sheets
Wean Engineering Co., Inc., The, Warren, Ohio.

TONGS—Automatic
Heppenstall Co., Pittsburgh.

TOOL HOLDERS
Armstrong Bros. Tool Co., Chicago.

TOOLS—Lathe
Armstrong Bros. Tool Co., Chicago.

TOOLS—Metal Cutting
Michigan Tool Co., Detroit, Mich.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
R & L Tools, Philadelphia.

TOOLS—Precision
Starrett, L. S., Co., Athol, Mass.

TOOLS—Turning for Automatics
R & L Tools, Philadelphia.

TORCHES—Brazing, Cutting and Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

TOWERS—Water Cooling
Marley Co., The, Kansas City, Kansas.

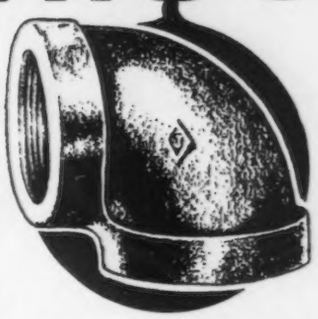
TRACTORS AND TRAILERS — See Trucks, Tractors and Trailers—Industrial

TRAILERS—Industrial—See Trucks, Tractors and Trailers—Industrial

TRAMRAILS—Overhead Systems
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

TRAMWAYS—Wire Rope
Leschen, A., & Sons Rope Co., St. Louis, Mo.

JARECKI Fittings



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PRODUCTS INDEX

TRANSMISSIONS—Hydraulic
American Engineering Co., Philadelphia.
Oilgear Co., The, 1311 W. Bruce St., Milwaukee.
Vickers, Inc., 1420 Oakman Blvd., Detroit.

TRANSMISSIONS—Variable Speed
Reeves Pulley Co., Columbus, Indiana.

TRAPS—Steam
Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

TREADS—Safety
Blaw-Knox Co., Pittsburgh.
Hendrick Mfg. Co., Carbondale, Pa.
Norton Co., Worcester, Mass.

TROLLEYS
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Hanna Engineering Works, 1761 Elston Ave., Chicago.

TRUCKS—Dump (Industrial)
Towmotor, Inc., Cleveland.

TRUCKS—Elevating (Power)
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.
Towmotor, Inc., Cleveland.
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

TRUCKS—Lift (Hand & Foot)
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

TRUCKS—Scoop (Industrial)
Towmotor, Inc., Cleveland.

TRUCKS, TRACTORS AND TRAILERS—Industrial
Atlas Car & Mfg. Co., The, Cleveland.
Baker-Raulang Co., The, 2175 W. 25 St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.
Towmotor, Inc., Cleveland.
Yale & Towne Mfg. Co., The, Phila., Div., Phila., Pa.

TUBE MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
United Engineering & Fdry. Co., Pgh.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

TUBES—Boiler
Bissett Steel Co., The, Cleveland.
Jones & Laughlin Steel Corp., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Pittsburgh (Pa.) Steel Co.
Steel & Tubes, Inc., Cleveland.

TUBES—Copper Alloy
American Brass Co., The, Waterbury, Conn.

TUBES—High Carbon
Steel & Tubes, Inc., Cleveland.

TUBES—Nickel Silver
American Brass Co., The, Waterbury, Conn.

TUBES—Stainless Steel
Bissett Steel Co., The, Cleveland.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Ryerson, Jos., T., & Son, Inc., Chicago.
Steel & Tubes, Inc., Cleveland.

TUBING—Aluminum Seamless
Aluminum Co. of America, Pittsburgh.

TUBING—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

TUBING—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

TUBING—Nichrome
Steel & Tubes, Inc., Cleveland..

TUBING—Open Seam
Steel & Tubes, Inc., Cleveland.

TUBING—Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.

TUBING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

TUBING—Seamless Steel
Bissett Steel Co., The, Cleveland.
Jones & Laughlin Steel Corp., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Ohio Seamless Tube Co., The, Shelby, Ohio.
Pittsburgh (Pa.) Steel Co.
Ryerson, Jos. T., & Son, Inc., Chicago.
Steel & Tubes, Inc., Cleveland.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Youngstown (Ohio) Sheet & Tube Co., The.

TUBING—Square and Rectangular
Steel & Tubes, Inc., Cleveland.

TUBING—Stainless Steel
Steel & Tubes, Inc., Cleveland.

TUBING—Tinned Brass or Copper
Bundy Tubing Co., Detroit, Mich.

TUBING—Tinned-Steel
Bundy Tubing Co., Detroit, Mich.

TUBING—Tool Steel
Bissett Steel Co., The, Cleveland.

TUBING—Welded Steel
Bundy Tubing Co., Detroit, Mich.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Ohio Seamless Tube Co., The, Shelby, Ohio.
Steel & Tubes, Inc., Cleveland.
Youngstown (Ohio) Sheet & Tube Co., The.

TUBULAR PRODUCTS
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Steel & Tubes, Inc., Cleveland.

TUMBLING BARRELS—See Barrels—Tumbling

TUNGSTEN METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

TUNGSTEN CARBIDE
Firth-Sterling Steel Co., McKeesport, Pa.

TURBINE-GENERATORS—Steam
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TURNTABLES
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

TURNTABLES—Industrial
Canton Fdry. & Mch. Co., Cleveland.

TWIST DRILLS
Cleveland (Ohio) Twist Drill Co., The.
Greenfield (Mass.) Tap & Die Corp.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Victor Machinery Exchange, 251 Centre St., N. Y. C.

TYPE—Steel
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

UNIONS
Crane Co., Chicago.

UNIT HEATERS—Electric
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.

VALVES—Acid Resisting
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
National Lead Co., 111 Bdway., N. Y. C.

VALVES—Air Blast for Presses
Littell, F. J., Mch. Co., Chicago.

VALVES—Air & Hydraulic Control
Galland-Henning Mfg. Co., Milwaukee.
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Hannifin Mfg. Co., Chicago.
Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.
Tomkins-Johnson Co., The, Jackson, Mich.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

VALVES—Gas, Water and Steam
Crane Co., Chicago.
Jarecki Mfg. Co., Erie, Pa.
Wood, R. D., & Co., Philadelphia.

VALVES—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Crane Co., Chicago.
Galland-Henning Mfg. Co., Milwaukee.
Vickers, Inc., 1420 Oakman Blvd., Detroit.
Wood, R. D., & Co., Philadelphia.

VALVES—Pump, Rubber
Garlock Packing Co., The, Palmyra, N. Y.

VANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

VISES
Cincinnati (Ohio) Milling Mch. Co., The.
Jarecki Mfg. Co., Erie, Pa.
Knu-Vise Products Co., Detroit, Mich.

WASHERS—Bevel Steel
Nicetown Plate Washer Co., Inc., Philadelphia.

WASHERS—Iron or Steel
Nicetown Plate Washer Co., Inc., Philadelphia.
Sessions, J. H., & Son, Hooker Court, Bristol, Conn.
Shakeproof Lock Washer Co., Chicago.

WASHERS—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

WASHERS—Lock
American Nut & Bolt Fastener Co., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
National Lock Washer Co., The, Newark, N. J., and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The, Newark, N. J.
Shakeproof Lock Washer Co., Chicago.
Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The, Worcester, Mass.

PRODUCTS INDEX

WASHERS—Special
Shakeproof Lock Washer Co., Chicago.

WASHERS—Spring
American Nut & Bolt Fastener Co., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
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Positive Lock Washer Co., The, Newark, N. J.
Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The, Worcester, Mass.

WATER SOFTENERS AND PURIFIERS
Scaife, Wm. B., & Sons Co., Ptgh.

WELDER CONTROL—For Spot, Butt & Projection Welding Machines
Electric Controller & Mfg. Co., The, Cleveland.

WELDING—Copper Hydrogen Electric
Bundy Tubing Co., Detroit, Mich.

WELDING—Electric
Federal Machine & Welder Co., Warren, Ohio.
Lincoln Electric Co., The, Cleveland.
Westinghouse Elec. & Mfg. Co., East Ptgh.

WELDING CONTACTORS
Clark Controller Co., The, Cleveland.

WELDING AND CUTTING MACHINES AND EQUIPMENT—Oxy-Acetylene
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

WELDING FIXTURES
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

WELDING MACHINES—Butt
Federal Machine & Welder Co., Warren, Ohio.
Swift Electric Welder Co., Detroit.

WELDING MACHINES—Electric Arc
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Lincoln Electric Co., The, Cleveland.
Westinghouse Elec. & Mfg. Co., East Ptgh.

WELDING MACHINES—Electric Arc, Second-Hand. (See Clearing House Section)

WELDING MACHINES—Flash
Federal Machine & Welder Co., Warren, Ohio.
Swift Electric Welder Co., Detroit.
Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Press
Federal Machine & Welder Co., Warren, Ohio.
Swift Electric Welder Co., Detroit.

WELDING MACHINES—Seam
Federal Machine & Welder Co., Warren, Ohio.
Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Spot
Federal Machine & Welder Co., Warren, Ohio.
Swift Electric Welder Co., Detroit.
Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WHEELS—Rolled Steel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Standard Steel Wks. Co., Burnham, Pa.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh.

WIRE—Barb
Pittsburgh (Pa.) Steel Co.

WIRE—Brass, Bronze, Copper, Nickel Silver or Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.

WIRE—Flat, Round, Square or Special Shapes
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.
Prentiss, Geo. W., & Co., Holyoke, Mass.
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Bros., Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Insulated
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE—Mattress
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE—Netting
Ludlow-Saylor Wire Co., St. Louis, Mo.
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Brothers, Cortland, N. Y.

WIRE—Piano and Music
Webb Wire Works, New Brunswick, N. J.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Rustless
Rustless Iron & Steel Corp., Baltimore, Md.

WIRE—Special Drawn Shapes
Rathbone, A. B. & J., Palmer, Mass.

WIRE—Spring
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Jones & Laughlin Steel Corp., Pittsburgh.
Pittsburgh (Pa.) Steel Co.
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE—Spring (Music)
Webb Wire Works, New Brunswick, N. J.

WIRE—Stainless Steel
Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.
Rustless Iron & Steel Corp., Baltimore, Md.
Webb Wire Works, New Brunswick, N. J.

WIRE—Steel
Bethlehem (Pa.) Steel Co.
Prentiss, Geo. W., & Co., Holyoke, Mass.
Wickwire Brothers, Cortland, N. Y.

WIRE—Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Lincoln Electric Co., The, Cleveland.
Maurath, Inc., 7400 Union Ave., Cleveland.
Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.
Pittsburgh (Pa.) Steel Co.
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE BELTS
Cambridge (Md.) Wire Cloth Co.

WIRE CLOTH
Buffalo (N. Y.) Wire Wks. Co., Inc.
Cambridge (Md.) Wire Cloth Co.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Bros., Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE DRAWING MACHINERY—See Wire Mill Mchry. & Equip.

WIRE FORMING MACHINERY
Baird Mch. Co., The, Bridgeport, Conn.
Nilson, A. H., Mach. Co., Bridgeport, Ct.
Sleeper & Hartley, Inc., Worcester, Mass.

WIRE MILL MACHINERY AND EQUIPMENT
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

WIRE NAIL MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

WIRE PRODUCTS
American Spring & Mfg. Corp., Holly, Mich.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Bethlehem (Pa.) Steel Co.
Buffalo (N. Y.) Wire Wks. Co., Inc.
Eastern Tool & Mfg. Co., Bloomfield, N. J.
Hindley Mfg. Co., Valley Falls, R. I.
Pittsburgh (Pa.) Steel Co.
U. S. Steel Wire Spring Co., Cleveland, O.
Wickwire Bros., Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE ROPE
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.
Bethlehem (Pa.) Steel Co.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Leschen, A., & Sons Rope Co., St. Louis, Mo.
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE ROPE FITTINGS
Roebling's, John A., Sons Co., Trenton, N. J.

WIRE STRAIGHTENING AND CUTTING MACHINERY—Automatic
Shuster, F. B., Co., The, New Haven, Ct.

WRENCHES
Armstrong Bros. Tool Co., Chicago.
Billings & Spencer Co., Hartford, Conn.

WRENCHES—Pipe
Greenfield (Mass.) Tap & Die Corp.
Ridge Tool Co., Elyria, Ohio.

WRENCHES—Pneumatic
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

ZINC—SLAB (Spelter)
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ZINC—Strip
Platt Bros. & Co., The, Waterbury, Conn.

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DRILLS. Nos. 121, 217, 315, 321 Baker
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DRILLS. 3¼', 4', 5', 6' Western radial
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GRINDER. No. 73 A3 Heald Sizematic
GRINDER. 26". No. 16 Blanchard surface
GRINDER. 12". Arter rotary surface
GRINDER. No. 4 Brown & Sharpe univ.
GRINDER. No. 84 Gardner opposed disc
HAMMER. No. 5 type I Nazel air
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LATHE. 18"x6' & 20"x8' Hendey, TA, RA
LATHE, TURRET. 24" & 42" Bullard vert.
LATHE, TURRET. Nos. 2, 2A, 3A, 4 & 6 W.&S.
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LATHE, STUB. 8" Sundstrand
MILL, BORING. 34" Colburn
MILL, BORING. 42" King
MILL, BORING. 60" Gisholt
MILLER. No. 1½, 2, 3 & 4 Cincinnati
MILLER. No. 1½ Rockford univ.
MILLER. No. 2 Brown & Sharpe vert.
MILLER, ROTARY. 24", 48", 54", 66" Newton
MILLER. No. 4-36 Cincinnati Hydromatic
MILLER. Nos. 13B & 33 Brown & Sharpe
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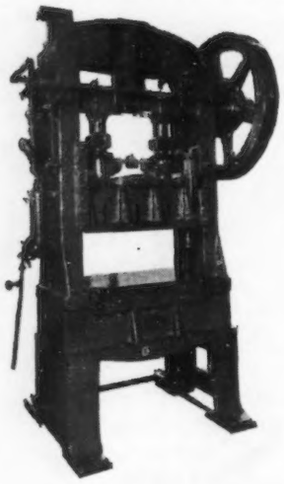

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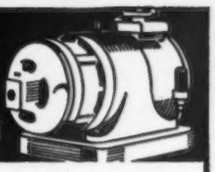

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Procurement Division, Public Buildings Branch, Washington, D. C., Sept. 15, 1938—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Oct. 21, 1938, for the construction of Junior Medical Officers' Quarters, Garages, Etc., at the U. S. Marine Hospital at Detroit, Mich. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., Sept. 15, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Oct. 11, 1938, for construction of foundations, etc., for extension No. 1 to Building No. 1, Main Hospital Building, U. S. Marine Hospital at Stapleton, Staten Island, New York, N. Y. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., Sept. 6, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Oct. 13, 1938, for construction of the U. S. P. O. at Canoga Park, Calif. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., Sept. 2, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Oct. 6, 1938, for construction of the U. S. P. O. at Black River Falls, Wis. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., Aug. 30, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Oct. 7, 1938, for construction (except elevators) of the U. S. P. O. Annex at Providence, R. I. Upon application, two sets of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $15 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

Procurement Division, Public Buildings Branch, Washington, D. C., Sept. 1, 1938.—Sealed proposals in duplicate will be publicly opened in this office at 1 P.M., Oct. 4, 1938, for construction of the U. S. P. O. at Cambridge, Minn. Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch.

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